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ABSTRACT

Corporate Governance, Capital Market Discipline and the Returns on Investment*

by Klaus Gugler, Dennis C. Mueller and B. Burcin Yurtoglu

We analyze the impact of corporate governance institutions, ownership structures and external capital market constraints on company returns on investment by using a sample of more than 19,000 companies from 61 countries across the world. We show that (1) of these three sets of institutions, the origin of a country's legal system proves to be the most important. Companies in countries with English-origin legal systems earn returns on investment that are at least as large as the cost of capital. (2) Differences in investment performance related to a country's legal system dominate differences related to ownership structure. (3) Strong external capital markets improve the investment performance of companies.

Keywords: Return on Investment, Ownership Structure, Corporate Governance, Capital Market

JEL Classification: G32, G34, L21

ZUSAMMENFASSUNG

Corporate Governance, Kapitalmarktdisziplinierung und die Renditen von Unternehmensinvestitionen

Dieses Papier analysiert den Einfluß von Corporate Governance Institutionen, Eigentümerstrukturen und externen Kapitalmärkten auf die Renditen von Investitionen für ein Sample von mehr als 19.000 Unternehmen aus 61 Ländern weltweit. Wir zeigen, dass von diesen drei Institutionen (1) die Herkunft des Rechtssystems eines Landes der wichtigste Faktor ist. Unternehmen in Ländern mit Rechtssystemen englischer Herkunft verdienen Renditen, die die Kapitalkosten im Durchschnitt abdecken. (2) Unterschiede im Rechtssystem eines Landes dominieren Unterschiede in der Eigentümerstruktur. (3) Funktionierende externe Kapitalmärkte verbessern die Performance von Investitionen.

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Like all good theories, the neoclassical theory of investment, as first formulated say by Modigliani and Miller (1958), derives strong and refutable predictions from an elegant and simple model. Assuming that managers maximize the wealth of their shareholders, they invest until the point where their cost of capital equals the marginal returns on investment. Since the cost of capital is the same for internally and externally raised funds, investment levels are independent of how they are financed, and for the same reason, the returns on investment are predicted to be the same for all companies, abstracting from differences in corporate risk.

A large empirical literature contradicts each of these predictions. Investment appears to be related to the source of finance suggesting the existence of a *hierarchy of financ*e.[1] Funds raised from outside of a firm to finance investment cost more than internal cash flows. Estimates of returns on corporate investment vary widely and are often substantially below company costs of capital.[2] A variety of hypotheses have been put forward to explain these empirical findings including the existence of differential *transaction costs* in using the external capital market to finance investment (Duesenberry, 1958), *asymmetric informatio*n, which raises the costs of using external capital markets (Stiglitz and Weiss, 1981; Myers and Majluf, 1984), and *agency problems* that allow managers to select investment levels that do not maximize shareholder wealth (Baumol, 1959; Marris, 1964, 1998; Grabowski and Mueller, 1972).

Much of the theoretical work on investment has consciously or implicitly assumed the existence of an "Anglo-Saxon" institutional environment. Companies are isolated legal entities, which contract with other independent legal entities or individuals when they raise capital externally. Thus arises the possibility that the managers inside of a firm have different information about the returns on investment projects from the information available to potential suppliers of finance outside the firm. Common share ownership is assumed to be widely dispersed, resulting in deficient monitoring of managers and agency problems. Most of the empirical work that has tested these hypotheses about investment has also used datasets drawn from Anglo-Saxon countries like Canada, the UK and the USA.

Hoshi, Kashyap and Scharfstein (1991) were among the first to demonstrate the importance of the institutional environment to these hypotheses. They showed that the kind of asymmetric information problems that can produce a relationship between cash flows and investment in Anglo-Saxon countries do not exist for Japanese companies belonging to *group*s, which generally include both other companies and a group bank. A group firm's "external sources of finance" have access to the same information as its managers do, and thus external capital carries no premium with it, and internal cash flows lose their power to explain levels of investment.

In the last decade several additional studies have appeared that confirm the importance of institutional factors in explaining corporate investment with data from non Anglo-Saxon countries. One set of studies has stressed the importance of institutional factors in explaining why and when cash flows are significant determinants of capital investment and R&D.[3] A second line of research examines how cross-national differences in capital market and corporate governance institutional structures are related to measures of performance like productivity and economic growth.[4]

Our work also emphasizes the importance of institutional factors in determining a country's economic performance, but differs from this other research in that we use a measure of performance that is directly tied to the micro-theory of the firm – the ratio of a firm's returns on investment to its costs of capital. We focus upon three sets of institutions: (1) the corporate governance structure of a country as defined by its legal system, e.g., rules governing takeovers, the composition and election of boards of directors, etc. (2) the ownership structure of a company, and (3) the strength of a country's external capital market. The first two sets of institutions determine how closely a manager's goals are aligned with those of the owners of a firm, and thus the extent to which a firm's investment performance may suffer from agency problems. The third set of institutions determines the extent to which a firm's investment performance is constrained by the capital market *regardless* of how closely managers' and owners' interests coincide. Our paper presents evidence that all three sets of institutions can affect the investment performance of companies in a given country.

We proceed as follows: The main hypotheses tested are developed in the following section. Section II describes the methodology employed to measure returns on investment and test the different hypotheses. The data used in these tests are discussed in section III. The results regarding the effects of corporate governance and ownership structures are presented in section IV, and regarding external capital markets in section V. Conclusions are drawn in the final section.

I. Main Hypotheses

A. Legal Institutions and Returns on Investment

A firm that maximizes shareholder wealth invests up until the point where the *marginal* return on investment equals its cost of capital. In our empirical work we measure what effectively amounts to a marginal Tobin's q, q_m, where $q_m = r/i$ and r is the *average* rate of return on a firm's investment, and i is its cost of capital. Since the average return of investment should be equal to or greater than the marginal return, we predict for a firm, which maximizes shareholder

wealth, $q_m \geq 1$.

We shall define a *strong* corporate governance system as one, which aligns managerial and shareholder interests and thus leads managers to maximize shareholder wealth. Managerial and shareholder interests are more likely to be aligned in countries in which it is easy for shareholders to monitor managers, and initiate proxy fights or hostile takeovers if they are displeased with their company's performance. La Porta, Lopez de Silanes, Shleifer and Vishny (1997, 1998, hereafter LLSV) have recently categorized the legal environments of countries according to the protections of this sort that they give to shareholders. We shall employ their categorization as a measure of the strength of a country's corporate governance system, and use it to test:

Hypothesis 1: For companies located in countries with strong corporate governance systems, $q_m \geq 1$.[5]

Weak corporate governance systems allow managers to pursue their own goals at the shareholders' expense. Recent research has focused on the conflict between managers and shareholders over dividend payments (LLSV, 2000; Faccio et al., 2001; Gugler and Yurtoglu, 2000). Where corporate governance systems are weak managers pay out less in dividends and retain larger fractions of their cash flows to pursue their own goals. Among these may be the pursuit of size and growth as emphasized in the earlier managerial discretion literature.[6] The flip side of paying out too little dividends is investing too much. This reasoning leads us to expect $q_m < 1$, in countries with weak corporate governance systems.

Some firms have attractive investment opportunities and limited financial resources, however, and both their managers and their shareholders benefit from their achieving high investment rates and rapid growth. For these companies no conflict between managers and shareholders over dividend and investment policies exists. Indeed, these companies are often young firms in rapidly growing industries – the kinds of companies that can suffer from asymmetric information problems – and thus are likely to *under* invest, so that $q_m \geq 1$. This consideration leads us to qualify our prediction for weak corporate governance systems.

Hypothesis 2: For companies with limited investment opportunities that are located in countries with weak corporate governance systems, $q_m < 1$.

B. Legal Institutions, Ownership Structures and Returns on Investment

Of necessity a manager's interests are aligned with those of a shareholder, if the shareholder and manager are one and the same person. Thus, a necessary condition for the existence of a conflict of interest between managers and shareholders is for there to be a *separation of ownership from control*, and all early contributions to the managerial-discretion literature cited Berle and Means (1932) to this effect. This literature implicitly assumed that when ownership was concentrated, either the managers themselves or an outside family held the controlling stake in the firm. In either case it was assumed that the owners wished to have the managers maximize their wealth, and thus that manifestations of managerial discretion, like low returns on investment, would be observed only when share ownership was widely dispersed. This hypothesis will be tested by comparing the mean q_m for companies with widely dispersed ownership with the mean for other companies in countries with strong corporate governance structures.

Hypothesis 3: In countries with strong corporate governance systems, companies with widely dispersed shareholdings have lower q_ms than the other companies in their country group.

Joseph Schumpeter (1911, 1934, p. 94) was perhaps the first economist to postulate that managers are empire builders. Schumpeter did not put forth this assumption to explain the actions of Berle/Means managers who own small fractions of shares, however, but as a description of the goals of the owner-entrepreneurs who founded the giant enterprises that appeared in the late 19th and early 20th centuries, individuals whom he likened to "medieval knights" seeking to found "dynasties." The intrinsic rewards from running a giant enterprise may appeal to professional and owner managers alike. Moreover, the persons typically classified as owner managers do not own all of the company's outstanding shares. Thus, a manager/shareholder conflict still is possible with respect to the interests of minority shareholders. In addition, in countries where takeovers and proxy contests are relatively easy to initiate, a manager's immunity to such attacks *increases* with her shareholdings. Thus, a priori it would seem that managers' incentive to maximize shareholder wealth might increase or decline with their shareholdings. Consistent with this ambiguity, Morck, Shleifer and Vishny (1988) have observed for the U.S. that Tobin's *q* first rises, then falls and finally rises again as managers' shareholdings increase. These considerations lead us to conclude that *no* simple predictions about the values for q_m for companies controlled by individuals or families can be made for countries with strong institutional protections of minority shareholders.

In countries with weak protections the situation is somewhat different. First of all, in these

countries we do not expect to observe as many companies with dispersed share ownership as in countries with strong protections of minority shareholders. Investors will be unwilling to bid large sums for shares when they know that they can be exploited by the dominant shareholders, and the owner-founders will therefore not issue many shares.[7] When one observes a company with widely dispersed ownership in a country whose legal institutions do not protect minority shareholders, one must assume that the company had sufficiently attractive investment opportunities, or the original dominant owners were somehow able to bond themselves to not exploit minority shareholders, so that they were able to issue many shares. These firms can be expected to earn relatively high returns on investment, and thus we obtain:

Hypothesis 4: In countries with weak corporate governance systems, companies with widely dispersed shareholdings have higher q_ms than the other companies in their country group.

Although the existing literature leads to the prediction that individually-controlled companies have higher returns on investment than other companies in countries with strong corporate governance systems, no similar prediction can be made for individually-controlled companies in countries with weak corporate governance systems. All companies in our sample have issued common shares, which are traded on organized securities markets. The individual or family who controls a company, which we have categorized as individually-controlled, owns the largest block of the company's shares, but not all of them. Any funds distributed to all shareholders must thus be *shared* with other shareholders. Thus if it is possible, the individual or family who controls a company may try to appropriate company funds in ways that do not add value to the company's shares. Weak corporate governance systems provide greater scope for the exploitation of minority shareholders by the dominant shareholder, and make it impossible to predict whether individually-controlled companies in countries with weak corporate governance systems will exhibit superior investment performance.[8]

Similar difficulties arise in trying to hypothesize about the relative performance of companies falling into the remaining three ownership categories that we identified: firm-controlled, finance-controlled and state-controlled, where by finance-controlled we mean controlled by a bank, insurance company or some other financial institution. For example, it is reasonable to expect that those in control of any firm *A*, even if they are empire builders, will want the managers of any firm *B* that *A* controls to maximize its profits, as this provides more funds for *A* to pursue the goals of those who control it, whatever they may be. Thus, we might expect higher returns on investment for firms that are controlled by other companies.

On the other hand, there are several reasons why companies lower down in a pyramid may exhibit poor investment performance: (1) the families standing behind these pyramids are empire builders who are willing to sacrifice profits at all levels of the pyramid in pursuit of their goals, (2) the pyramid's size makes careful monitoring of lower-level firms difficult, and (3) the performance of lower level firms is sacrificed to benefit the parent firm at the top of the pyramid.[9] Given these conflicting possibilities, we do not think that it is possible to make specific predictions regarding the investment performance of companies controlled by other companies. We shall, however, test to see whether this category of ownership is associated with systematic differences in investment performance. We examine the effects of cross-ownership and corporate pyramids separately.

Predicting the effects of financial control on investment performance is equally difficult. Banks and other financial institutions are also susceptible to agency problems between their managers and ultimate owners. Merger activity in the banking sector of the United States and Europe in recent years suggests that some bank managers may also find empire-building to be an attractive pursuit. A bank's managers may condone and even finance the aggressive expansion programs of firms that it controls so long as they can pay the interest on debt owed to the bank, since the bank's growth rate is positively linked to that of these firms. Thus, companies controlled by financial institutions might not perform any better than other companies. Germany's strong economic performance during the first quarter century following World War II has often been attributed to wise advice and careful monitoring of the private sector provided by its major banks and other financial institutions. Many observers now think that the role of banks in Germany has been exaggerated, however.[10] Some observers even *blame* major banks in Asia for making the "crisis" of the late 1990s worse than it would have been[11]. We shall test for any systematic effects of control by financial institutions on company investment performance, but make no predictions as to what this effect should be.

A double principal-agent problem can be said to exist, in the case of state-controlled firms. Their ultimate owners are the citizens of the state. The same free-rider logic that makes shareholders poor monitors of managers when shares are widely dispersed, makes citizens poor monitors of politicians. Thus, citizens are unlikely to hold politicians accountable for the poor investment performance of a state-owned company, and elected politicians may not exert great effort monitoring these companies in the citizens' interests leading to poor investment performance. On the other hand, state-controlled firms are often located in key economic sectors and possess dominant market positions. These favorable circumstances might create sufficiently attractive investment opportunities for state-controlled companies to offset the inefficiencies

caused by agency problems. We again leave it to the data to sort out these conflicting tendencies.

C. Capital Market Discipline and Returns on Investment

Consider Figure 1. Investment outlays are given along the horizontal axis, and marginal returns on investment (mrr) and the cost of capital, *i*, along the vertical axis. If the costs of external and internal capital are the same, a firm with marginal returns on investment of mrr_H and internal cash flows *CF*, maximizes shareholder wealth by investing I_H and raising (I_H - *CF*) on the external capital market. Its $mrr = i$, and its *average* return on investment, *r*, will be greater than *i* making $q_m = r/i > 1$.

If the costs of external capital are greater than for internal capital because of the transaction costs of issuing bonds and equity, or because of asymmetric information problems between managers and the capital market, the shareholder-wealth-maximizing firm invests less than I_H and $mrr > i$, and q_m rises still further above one. Thus for firms that maximize shareholder wealth, their returns on total investment should be greater than their costs of capital, and this relationship should hold regardless of the source of investment funds. We shall use subscripts to designate sources of investment funds:

$q_{m,I}$ = the ratio of *r* to *i* for total investment,

$q_{m,CF}$ = the ratio of *r* to *i* for investment out of cash flow,

$q_{m,D}$ = the ratio of *r* to *i* for investment out of new debt, and

$q_{m,E}$ = the ratio of *r* to *i* for investment out of new equity.

We then have

Hypothesis 5: For companies with $q_{m,I} \geq 1$, it is also true that $q_{m,CF} \geq 1$, $q_{m,D} \geq 1$, and $q_{m,E} \geq 1$.

Now consider a firm with the marginal returns on investment schedule mrr_L. It maximizes shareholder wealth by investing I_L and paying $(CF - I_L)$ in dividends. If its managers wish to grow faster than the rate implied by this investment, they of course invest more than I_L. As *I* increases, *mrr* falls below *i*. If the firm were to invest all of its cash flow, its return on investment would be k, which could also be regarded as the implicit cost of internal capital. Should it wish to invest still more, it would have to enter the external capital market. Even if it only had to pay *i* for externally raised funds, these funds would cost considerably more than its

implicit cost of internal capital. Thus, for firms whose managers pursue growth, there is effectively a discontinuity in their cost of capital schedule at the point where they enter the external capital market, even if there are no transaction costs or information asymmetries to raise the cost of external capital above *i*. Thus, the prediction arises that growth-maximizing managers favor internal cash flows to finance their investments.

The prediction presumes, of course, that the firm must pay at least *i* when it enters the external capital market. When this is the case, we shall say that there exists *strong capital market discipli*ne. We state this definition as a hypothesis

Hypothesis 6: In countries with strong capital market discipline, for companies with $q_{m,I} < 1$, it is also true that $q_{m,CF} < 1$, but $q_{m,D} \geq 1$, and $q_{m,E} \geq 1$.

Our definition of a country with weak capital market discipline is simply one in which firms do not have to pay the full cost of externally raised capital. Soft loans are available from friendly banks, and some investors are willing to buy new debt and equity issues at prices that exceed the risk-adjusted present values of the interest and dividend streams that can be expected from the companies making these issues. Thus, we obtain

Hypothesis 7: In countries with weak capital market discipline, for companies with $q_{m,I} < 1$, $q_{m,CF} < 1$, and either $q_{m,D} < 1$, or $q_{m,E} < 1$, or both.

Since a bank loan or debt issue constitutes a more specific commitment and carries with it ostensibly greater penalties from breaking this commitment, we expect in general that $q_{m,D} > q_{m,E}$, whenever one or both are < 1. This leads to

Hypothesis 8: In countries with weak capital market discipline, for companies with $q_{m,I} < 1$, $q_{m,D} > q_{m,CF}$ and $q_{m,D} > q_{m,E}$.

Thus, in countries with weak capital market discipline, we predict a hierarchy in the *returns* on investment that differs from that usually assumed to hold for the *costs* of capital. The weakness of the implicit contract between managers and equity holders compared to the contractual relationship between debt holders and managers produces higher returns for investments out of new debt issues than for those made out of new equity issues and cash flows.

II. Methodology[12]

Let I_t be a firm's investment in period t, CF_{t+j} the cash flow this investment generates in $t+j$, and i_t the firm's discount rate in t.

$$PV_t = \sum_{j=1}^{\infty} \frac{C_{t+j}}{\left(1+i_t\right)^j} \tag{1}$$

We can then take the market's estimate of PV_t and the investment I_t that created it, and calculate a pseudo-permanent return r_t on I_t

$$PV_t = \frac{I_t\, r_t}{i_t} = q_{mt}\, I_t \tag{2}$$

If the firm had invested the same amount I_t in a project that produced a permanent return r_t, this project would have yielded the exact some present value as the one actually undertaken. The ratio of r_t to i_t, which we call q_{mt}, is the key statistic in our analysis. If a firm maximizes shareholder wealth, then it undertakes no investment for which $q_{mt} < 1$. That q_{mt} is a marginal q can be easily seen from (2) by contrasting it with Tobin's q. Tobin's q is the market value of the firm divided by its capital stock and is thus an *average* return. Marginal q is the change in the market value of a firm divided by the change in its capital stock (investment) that caused it.

The market value of the firm at the end of period t can be defined as

$$M_t = M_{t-1} + PV_t - \delta_t M_{t-1} + \mu_t \tag{3}$$

where δ_t is the depreciation rate for the firm's total capital as evaluated by the capital market, and μ_t is the market's error in evaluating M_t. The assumption of capital market efficiency implies that the error term in (3) has an expected value of zero, and thus that equation (3) can be used to estimate both δ and q_{mt} under the assumption that δ_t and q_{mt} are either constant across firms or over time, or both. Replacing PV_t in (3) with $q_m\, I_t$, and rearranging yields

$$\frac{M_t - M_{t-1}}{M_{t-1}} \quad = \quad -\delta \quad + \quad q_m \frac{I_t}{M_{t-1}} \quad + \quad \frac{\mu_t}{M_{t-1}} \tag{4}$$

Equation (4) is favored over other possible rearrangements of (3), because it does not involve a lagged dependent variable, and in cross-section regressions is less likely to be subject to heteroscedasticity owing to the deflation of all error terms by M_{t-1}[13]. Equations (3) and (4) incorporate the assumption that the market value of a firm at the end of year $t-1$ is the present

discounted value of the expected profit stream from the assets in place at $t-1$. Changes in market value are due to changes in assets in place as a result of investment and depreciation. The estimated q_ms are then essentially *marginal* Tobin's *q*s defined on all investments made in *t*.

The intuition behind (4) is straightforward. Abstracting from depreciation, when a firm invests $100 at a return equal to its cost of capital, its market value rises by $100. If its market value rises by more than $100, $r > i$. The depreciation factor, δ_t, measures the fall in the market value of the firm that would take place in year *t*, if it made no investments. It captures not only the decline in the value of a firm's capital equipment due to wear and tear, technological obsolescence and the like, but also the decline in the value of the firm's intangible $R\&D$ and advertising stocks due to imitation by competitor or the expiration of patents. Since the importance of technological change, $R\&D$, advertising, and the like, varies across industries, we shall estimate separate depreciation rates for each industry. General differences in corporate environments, like the intensity of competition, degree of state regulation, etc., will affect a company's profits and thus its market value. These differences are not likely to vary from year to year, however, and thus should not affect changes in market values nor our estimates of δ.[14]

To estimate (4) we need data on the market value of each firm and its investments. A firm's market value at the end of year M_t, is defined as the market value of its outstanding shares at the end of *t* plus the value of its outstanding debt. Since this number reflects the market's evaluation of the firm's total assets, we wish to use an equally comprehensive measure of investment. Accordingly we define investment as

$$I = \textit{After tax profits} + \textit{Depreciation} - \textit{Dividends} + \Delta D + \Delta E + R\&D + ADV\,.$$

ΔD and ΔE are funds raised using new debt and equity issues. Since $R\&D$ and advertising expenditures (ADV) are also forms of investment that can produce "intangible capital" which contributes to a company's market value, we add them to investment to obtain a measure of the firm's additions to its total capital.

II. The Data

The financial data are taken from the 1996-2001 versions of the *Global Vantage* and 1997 version of the *Compustat* databases of *Standard & Poor's*. These data sets contain accounting and stock price data on companies with listed stocks from virtually every country in the world starting in 1985. We exclude banks and financial companies and some service industries (SICs 6000 through 6999 and above 8100), because the nature of capital and investment in these industries is

not comparable to those of non-financial firms. To minimize the weight of outliers, we cap our basic variables at both the 1st and 99th percentiles of each country sample. After this procedure we are left with 19,010 companies. In many countries and for many companies data were not available for all 16 years. Table 1 reports the number of firms, time period coverage and total number of observations for each of the 46 countries, which we group according to the LLSV classification, and for China, nine transition countries and five African countries. It also reports the means, standard deviations and medians of the main variables used in our analysis. Appendix A details the construction of the variables.

Our ownership data come mainly from three sources: *AMADEUS* database for the European companies, *Compact Disclosure* for the US, and the *Asian (Japanese) Company Handbook* for Asian companies (Japan). The remaining data sources on ownership structure are listed in Appendix B.

IV. Tests of Hypotheses Regarding Corporate Governance and Ownership Structures

A. The Effects of Country Legal Systems

We first employ eq. 4 to test for significant differences in investment performance across countries that are related to the origins of their legal systems (Hypotheses 1 and 2). The intercept in eq. 4 is an estimate of the depreciation rate; the expected fall in a company's market value in any given year, if it makes no investments. Depreciation rates vary across companies depending on the kinds of capital they invest in. To allow for these differences, we assign each company to a two-digit SIC industry, and estimate a separate depreciation rate (intercept) for each industry.

Our model assumes that the stock market makes an unbiased estimate of the true value of a firm's total assets at the end of *t-1*, and all changes in the firm's market value during year *t* are therefore due to either its investment during this year or the depreciation in the value of its total assets. Stock markets are notoriously volatile, however,[15] and it is thus possible that annual changes in company market values are affected by general shifts in market sentiment that change the market's estimation of the value of assets in place. To correct for these swings in sentiment we use yearly deviations from country sample means for each variable in the regression.

Table 2 presents the results from this estimation using all available data for each country for the period 1985 through 2000. In Panel A estimates of depreciation rates are presented for 24 industries, along with estimates of q_m for six country groups. There are a total of 112,590 observations, and the model explains about 25 percent of the variations in company market

values. Turning first to the estimates of depreciation, we see that 16 of the 24 estimates have the predicted negative sign, and all but one of these falls in the plausible interval between zero and ten percent, the exception being the chemicals industry with pharmaceuticals removed (SIC 28), which had an estimated 15.5 percent depreciation rate per annum. Most of the negative depreciation rates (positive intercepts) are close to zero, but in the pharmaceuticals (SIC 283) and communications industries there appears to have been a sustained upward drift in prices over the last 15 years of the 20th century.

LLSV (1997) argue that countries with Anglo-Saxon legal systems have the strongest corporate governance systems followed in order by the Scandinavian, German and French origin countries. Countries with French origin legal systems are claimed to have the weakest corporate governance systems. Our estimates of returns on investment as a fraction of costs of capital, our $\hat{q}_m$ s, match this prediction. Countries with Anglo-Saxon legal systems have a $\hat{q}_m$ of 1.02, the highest value of any country group. The average firm in every other country group earned a return on investment significantly less than its cost of capital. Among the country groups classified by LLSV, the best performer was the Scandinavian group of countries with a $\hat{q}_m$ of 0.78, followed by the Germanic group ($\hat{q}_m$ = 0.74). Consistent with LLSV's arguments, the average firm in a French-origin country had a return on investment of only 59 percent of its cost of capital.

We also report $\hat{q}_m$ s for pooled groups of transition and African countries. The estimated returns on investment are 64 percent of company costs of capital for the transition countries. This low figure is consistent with the general impression that corporate governance structures in transition countries do not afford shareholders much protection against the managers of their firms, but also suggests that corporate governance structures in transition countries are no weaker and arguably marginally stronger than in French-origin countries.

Most students of development would also probably not expect that corporate governance structures are particularly strong in Africa. The $\hat{q}_m$ of 0.77 for the African countries, roughly the same as for the Scandinavian countries, is somewhat surprising, therefore. Since most of the African countries in our sample are former British colonies, this result might be interpreted as indicating that the remnants of British legal institutions left from colonization offer shareholders some protection even in an otherwise unfriendly environment for capitalist firms.

In Panel B of Table 2, we present separate estimates of q_m for individual countries grouped once again according to the LLSV categorization. We omit the coefficients on the industry dummies in this and all subsequent sets of results to save space. Their magnitudes and

significance are always comparable to that reported in Panel A. Roughly the same picture emerges when we observe the $\hat{q}_m$ s for the individual countries, as was seen for the entire groups. The countries with the strongest corporate governance systems– English-origin and the Scandinavian countries – have the lowest fractions of $\hat{q}_m s$ significantly less than 1.0 (8/16 and 2/ 4).[16] In contrast *five* of the six $\hat{q}_m$ for the German-origin, and 14 of 20 for the French-origin countries are significantly less than 1.0.

The effects of the "Asian crisis" can also be seen, when the results in Panel B are compared to earlier estimates of q_m by Mueller and Yurtoglu (2000). Using data up through 1996, they estimated $\hat{q}_m$ s > 1.0 for Hong Kong, Malaysia, Thailand and Japan, while these countries all pick up $\hat{q}_m s$ < 1.0 in our data. A split between the three Asian countries in the German-origin group and the three European ones was observed in the Mueller/Yurtoglu study and can still be seen in our results, despite the Asian crisis. Taiwan's $\hat{q}_m$ *is* significantly greater than 1.0, and Japan's is much higher than either Switzerland's or Germany's $\hat{q}_m$.

Other than this division within the German-origin group, we have not been able to discern any obvious geographic pattern to our estimates of investment performance besides that related to country legal systems. Many of the countries with low $\hat{q}_m s$ are in Europe, but the differences in $\hat{q}_m s$ in Panel B of Table 2 cannot be explained by a simple Europe/non-Europe dichotomy. Within Europe the only three countries with $\hat{q}_m s$ insignificantly different from 1.0 (Ireland, Norway and Finland) are in the two LLSV categories with the strongest corporate governance systems. Great Britain has the fourth highest $\hat{q}_m$ of the European countries. The *nine* lowest $\hat{q}_m s$ for Europe belong to countries in the two lowest LLSV categories (Germany, Switzerland, Belgium, France, Greece, Italy, Portugal, Spain and Turkey).

Differences in investment opportunities may also explain why some of the $\hat{q}_m$ s in countries with weak corporate governance systems (e.g., Chile and Taiwan) are both greater than 1.0 and much higher than for other countries in these groups. It is perhaps worth pointing out that differences in investment opportunities cannot explain estimates of q_m that are significantly *less* than 1.0 in members of the Anglo-Saxon group like Great Britain and New Zealand. If companies in these countries have poor investment opportunities, which is of course quite possible, this should lead to low *levels* of investment, if managers are maximizing shareholder wealth. Poor investment performance ($\hat{q}_m < 1$) can only come about, if managers invest more than the amount that would maximize shareholder wealth.

At the bottom of Panel B we present the $\hat{q}_m$ for China. It is 0.45. Corporate governance institutions in Communist China do not appear to do a very good job aligning manager and shareholder interests.

B. The Effects of Ownership Structures

In Section I we put forward several hypotheses that related investment performance to the ownership structure of a firm. These hypotheses are tested by using eq. 4, and allowing q_m to take on different values depending on both a company's country of origin and its ownership structure. Whenever the largest shareholder owns 10% or more of a company's equity, the company is categorized as owned by this person or institution. Given the differences observed in Table 2 between the $\hat{q}_m$s for the three European countries with Germanic-legal-systems and the three Asian countries in this group, we have divided the German-origin countries into European and Asian subgroups.

Table 3 presents our results from this exercise. Twenty-four separate depreciation rates were again estimated, but are not reported. Under each origin heading there are two entries. The first entry for each ownership category represents the point estimate of $\hat{q}_m$ for that category. Thus, family controlled firms in English-origin countries have a $\hat{q}_m$ of 1.082, which is significantly greater than 1.00 as indicated by the p-value of a two-tailed test below this coefficient. The second entry is the $\hat{q}_m$ for the remaining companies in that country group. Thus, the $\hat{q}_m$ for all English-origin companies that were not family controlled is 1.019. The > separating these two numbers indicates that the first entry is greater than the second, and the number below the inequality is the level of significance of this difference. Entries in boldface indicate differences significant at the 5 percent level, two-tailed test.

The first thing that stands out in Table 3 is that *all* $\hat{q}_m$s > 1.0 for the English-origin countries, as opposed to only three for the remaining 40 entries in the table. The origin of a country's legal system overwhelms differences in ownership structures in explaining returns on investment.

Hypothesis 3 predicts that companies with dispersed ownership should have lower q_ms than other companies in countries with strong corporate governance systems. The $\hat{q}_m$ for dispersed-ownership companies is less than for the remaining firms in the Anglo-Saxon countries, but the difference is not statistically significant. Thus, we cannot accept Hypothesis 3. We note again,

however, that q_m is an estimate of a company's *average* return on investment relative to its cost of capital, since the estimate is made using data on total investment in each year. Shareholder wealth maximization requires equating the *marginal* returns on investment to the cost of capital. Thus, the estimate of q_m of 1.001 for dispersed-ownership firms in Anglo-Saxon countries likely implies a marginal return on investment somewhat under their costs of capital, suggesting some agency problems for these companies.

The significantly higher $\hat{q}_m$ for the companies controlled by individuals (families) might also be interpreted as indirect evidence of agency problems when ownership is dispersed. An alternative interpretation would be that family-controlled companies have trouble raising capital externally due to asymmetric information problems. This interpretation might also explain the significantly smaller $\hat{q}_m$ for companies controlled by financial institutions. These companies presumably do not have trouble raising external capital to finance worthy investment projects.

Hypothesis 4 predicts that companies with dispersed ownership have higher returns on investment than other firms in countries with weak corporate governance systems, since the owners were able to issue many shares in the first place by credibly committing themselves not to exploit small shareholders. This hypothesis finds support in both the Scandinavian and Germanic-European countries. In both cases the estimated q_m is above 1.0 and significantly higher than for the other companies in these two country groups. Given that only one other entry in Table 3 for a non-English-origin country is greater than one, these results provide rather strong support for Hypothesis 4 in these countries. Companies with dispersed ownership in Scandinavia and Germanic-Europe are mostly large, multinational firms, and it would appear that they are subject to the same corporate governance constraints as companies in the Anglo-Saxon countries.[17] In the three Asian countries with German-origin legal systems and the French-origin countries, no significant differences in the $\hat{q}_m$s for dispersed-ownership companies and the rest of the samples were observed, however.

Neither a priori reasoning nor the existing empirical evidence allowed us to make predictions about the relative performance of companies that are individually-controlled in countries with weak corporate governance systems, or are finance-controlled, or non-financial-controlled or state-controlled. Consistent with these ambiguities, we generally find no significant difference between the $\hat{q}_m$ for companies in one of these ownership categories and that for all other firms in its country group. The only significant difference in investment performance for individually-controlled companies to be observed in Table 3 is for the English-origin countries as

predicted by Hypothesis 3.

The $\hat{q}_m$ for companies controlled by financial firms is significantly less than that for other firms in the English-origin group. This $\hat{q}_m$ is greater than one, nevertheless, and also greater than that for each of the other four country groups. It is thus not possible to say that financially-controlled firms in English-origin countries do badly in an absolute sense. The only other difference in $\hat{q}_m$s that is statistically significant occurs for the French-legal-system sample, where the point estimate of 0.692 is significantly greater than that of 0.579 for the rest of the sample. Although financial institutions appear to improve the investment performance of companies that they control in French-legal-system countries, they do not bring about a spectacular improvement. Companies controlled by financial firms are still predicted to have returns on investment that are less than 70 percent of their costs of capital. Their performance looks good only in comparison to other companies in the French-legal-system countries.

In none of the five country groups is there a significant difference between the $\hat{q}_m$ for firms controlled by other, non-financial companies and that of the rest of the sample. Managers of one company are not significantly better at monitoring managers of other companies than are other ownership groups.[18] As discussed above, this may be because the potential advantages managers have as monitors of other firms are dissipated through the construction of large pyramidal structures. Additional evidence on the performance of companies in corporate pyramids is presented in the following subsection.

The estimate of $\hat{q}_m$ for state-controlled companies in the three Germanic-European countries is 0.374, the smallest estimate in Table 3. Within these three countries, the agency problems associated with state-control of enterprises clearly seem to dominate. In three of the remaining four country groups the $\hat{q}_m$ for state-controlled companies is larger than for other firms, with the $\hat{q}_m$s for state-controlled companies in the three Asian countries with German-origin systems and the countries with French-origin systems being both insignificantly different from 1.0. In these two country groups, state firms actually exhibit the best investment performance of any ownership category. One explanation for this superior performance might be that state-controlled companies in these countries are located in industries with particularly attractive investment opportunities. Another possible explanation, of course, is that the state in these countries is an adept monitor of the firms that it controls.[19]

The results in Table 3 imply that ownership structures are less important determinants of investment performance than legal institutions. In the three Asian countries with German-origin

legal systems none of the $\hat{q}_m$s for any ownership category is significantly different from that for the remaining firms. In the four other country groups, only seven of the 20 $\hat{q}_m$s for particular ownership categories are significantly different from those for the remaining firms. The most consistent differences in $\hat{q}_m$s visible in Table 3 are across country legal systems rather than across ownership categories.

C. The Effects of Insider Ownership Concentration, Pyramiding, Cross-Shareholding and Voting Rights

In this subsection we present some additional tests of the effects of ownership structure for countries where we have a richer data set on ownership structures.

1. *The Effects of Insider Ownership in the United States*

As noted in section I, when ownership is concentrated in the hands of managers, it can have two, opposing effects on a company's investment performance. As a manager's ownership stake rises, the manager may identify more closely with other shareholders, and thus try to increase the market value of the firm. Alternatively, a larger ownership stake reduces the threat of dismissal thus freeing a manager to pursue goals that conflict with the other shareholders' interests. Thus, a priori rising ownership concentration in the hands of insider managers has an ambiguous impact on firm performance.

We use data on the shareholdings of managers of U.S. corporations to test for the effects of inside ownership concentration on investment performance. We do this by interacting inside ownership variables with the investment term on the right-hand-side of eq. 4. The results are presented in Table 4. The number under q_m is the coefficient on investment by itself, under *IO* is the coefficient on investment multiplied by the fraction of shares owned by insiders. IO^2 represents an interaction term with the square of *IO*, IO^3 with its cube. The estimated coefficients imply a similar nonlinear relationship between q_m and inside ownership concentration as Morck, Shleifer and Vishny (1988) (hereafter MSV) observed for Tobin's *q*. The predicted q_m rises from 0.95 as inside ownership increases from zero reaching a peak of 1.21 at a shareholding of 22 percent. From there q_m falls reaching a low of 0.92 at a shareholding of 68 percent, from there on it rises again. Thus, the entrenchment of management due to their possessing concentrated shareholdings results in a significant deterioration in their companies' investment performance over the range of ownership concentration levels from 22 to 68 percent. The turning points observed by MSV were at 5 and 25 percent.[20] Our sample is much larger than theirs, and contains

many smaller companies, which partly explains why the first turning point in our data comes at a much higher ownership concentration level. Managers of smaller firms must hold larger fractions of their companies' shares before they feel safe enough in their jobs to pursue policies that destroy their shareholders' wealth. When we restrict our sample to Fortune 500 firms as MSV did, the turning points in our data come at concentration levels of 11.6% and 40.3%. A second possible explanation for the difference in turning points is that our data are from the late 1980s and 1990s, while MSV's are from 1980. The late 1980s merger wave with its many, highly visible hostile takeovers may have raised the levels of share ownership that managers perceive to be necessary to protect them from hostile takeovers. Our data also imply that the level of ownership concentration at which managers' and shareholders' interests become realigned is much higher than that suggested by MSV.

2. ***The Effects of Pyramiding, Cross-Shareholding and Voting Rights in Europe***

Corporate pyramids in which company *A* owns a controlling interest in company *B*, *B* owns a controlling interest in *C*, and so on, are quite common in Western Europe. As noted in section I, companies in the lower levels of a pyramid can be expected to exhibit poor performance for several reasons: (1) the managers/families at the top of the pyramid are empire builders, (2) the managers at the top of the pyramid transfer resources from lower level companies up to the top, or (3) the distance between the top and a given company in the pyramid becomes too great for the managers at the top to monitor this company effectively. These considerations lead us to predict poorer investment performance for companies at lower levels in corporate pyramids.

Corporate pyramids can lead to a diversion of a dominant owner's interests and those of minority shareholders by allowing the dominant holder to lever the voting rights in her shares. When this occurs the dominant shareholder's control rights exceed her cash flow rights, allowing her to exploit minority shareholders. We thus predict poorer investment performance for companies for which the dominant shareholder's control and cash flow rights are unequal.

Cross-shareholdings in which company *A* owns shares in companies *B* and *C*, *B* owns shares in *A* and *C*, and so on, are also frequently observed in Western Europe. Such interlocking shareholdings can entrench the managers of all of the companies so joined, and thus free them to pursue their personal goals at the expense of outside shareholders.

To test these hypotheses three dummy variables were created: $PYRM = 1$, if a company is two or more levels down in a corporate pyramid, 0 otherwise; $VR = 1$, if the control and cash flow rights of the dominant shareholder are equal, 0 otherwise; and $CROSS = 1$, if a company is part of

a group of firms with cross-shareholdings, 0 otherwise. We again interact these three variables with the investment term on the right-hand-side of eq. 4, and include them along with investment in the equation. The results from this exercise are given in Table 5. All coefficients on the three interaction terms are statistically significant and of the predicted signs. They also imply economically significant impacts on investment performance due to differences in corporate governance structures. A company for which the control and cash flow rights of the dominant shareholder are equal, and it is not part of either a corporate pyramid or a group of companies linked by cross-shareholdings is predicted to have a return on its investment that is 80 percent of its cost of capital (0.68 + 0.12). In contrast, a company for which control rights exceed cash flow rights and is lower down in the pyramid and is linked to other companies by cross-shareholdings is predicted to have a return on its investment that is only 34 percent of its cost of capital (0.68 – 0.09–0.25).

3.*The Effects of Cross-Shareholding in Japan*

Cross-shareholdings are also common in Japan, where members of the so-called *keiretsu* hold shares in each others' companies. The same entrenchment of managers and negative effects on investment performance can be expected for members of these corporate groups. The first two entries in Table 6 report the $\hat{q}_m$ for independent firms (0.94) and the difference in $\hat{q}_m$ for group firms, both estimated over the entire sample period from 1985 through 2000. Members of corporate groups in Japan[21] can be seen to have a predicted q_m that is 0.11 lower than that for independent firms (significant at 1 percent level). The effect of cross-shareholdings in Japan is not as large as for European companies, but it goes in the same direction. Group firms in Japan have significantly lower returns on investment relative to their costs of capital than do independent companies.

As in most Asian countries, Japanese companies were hit hard by the "Asian crisis." Our sample also expands dramatically over the last few years of the sample period through the addition of a large number of independent companies. To gage the effects of these events, we reestimated the equation for the periods 1985-95 and 1996-2000, roughly before and after the crisis. Over the first period, the group firms can still be seen to perform significantly worse than the independent companies. Following the advent of the crisis both the independent and group firms exhibit much poorer investment performance, and the difference between independent and group firms disappears. Our results imply, however, that when economic conditions are normal, cross-holdings of shares among companies in Japan have a similar effect on returns on investment to that observed in Europe, if less deleterious.

V. Tests of Hypotheses Regarding the Effects of Capital Market Constraints on the Returns on Investments from Different Sources of Finance

In this section we test for the effects of capital market constraints on the returns on investment from different sources of finance. We first conduct these tests using our country group categories as proxies for differences in external capital market constraints, and then examine the effects of some alternative measures of capital market discipline.

A. The Effects of Country Legal Systems

The differences in legal institutions that have been used to distinguish among corporate governance systems also have implications with respect to the returns on investment that one expects from different sources of finance. To the extent that strong corporate governance structures protect shareholders' interests, we can expect the returns on investments out of cash flows *and* new equity issues to be positively related to the strength of a country's corporate governance structure. This leads us to predict that the returns on investments out of cash flows and new equity issues correspond to those observed for total investment across the different country legal environments. Since the contractual protections associated with debt are more specific and easier to enforce, a weaker or nonexistent relationship between corporate governance systems and returns on investment out of new debt is expected. For the same reason, we also predict for companies with returns on total investment that are less than their costs of capital, that the returns on debt are the highest of the three sources of funds.

These predictions are tested using eq. 4 by estimating separate coefficients on investment for each source of finance. The results are presented in Panel A of Table 7. Consider first the first four country categories.[22] The first row in each country group gives the estimates for the full sample of companies. The returns on investments out of cash flows follow the LLSV rankings of corporate governance systems except that the Scandinavian countries are ahead of the Anglo-Saxon countries. The lowest returns on reinvested cash flows occur for the French-legal-system countries as predicted.

Companies in the Anglo-Saxon countries obtain the highest returns on investments out of new equity issues. The second highest returns are not earned by companies in the Scandinavian countries, however, but in Germanic legal systems. The average returns on new equity issues in both the Scandinavian- and French-legal-system countries are significantly less than one. Consistent with the prediction that debt is a more binding commitment on managers than equity,

the returns on investments financed by new debt issues are seen to nearly equal their costs of capital across all legal systems.

One reason why the returns on reinvested cash flows and new equity issues reported in the first row of each country group do not correspond to differences in the strength of legal systems across the groups is that there may be important differences in investment opportunities across the groups. Companies that issue equity in some Germanic countries, like Japan and Taiwan, may have more attractive investment opportunities than companies in the Scandinavian countries. Accordingly the second and third sets of results in each group present estimates with the sample divided into companies for which $\hat{q}_m \geq 1$, and for which $\hat{q}_m < 1$.[23]

Hypothesis 5 predicts that for companies with $q_{m,I} \geq 1$, $q_{m,CF}$, $q_{m,D}$ and $q_{m,E}$ are also ≥ 1. This hypothesis is supported in each of the four country groups. For companies with attractive investment opportunities, no conflict between managers and shareholders exists over investment policies, regardless of a country's legal institutions. Indeed, the very high $\hat{q}_m$ estimated for some sources of funds for companies with $\hat{q}_{m,I} \geq 1$, suggests that these companies are cash/equity constrained, and that their shareholders would *benefit* from even greater amounts of investment.

The same cannot be said for the companies with $\hat{q}_{m,I} < 1$. All 12 $\hat{q}_m$s estimated on the different sources of funds are less than one for these companies. Thus, *none* of the four sets of legal institutions produces a strong external capital market as defined in Hypothesis 6 — $q_{m,D}$ and $q_{m,E} > 1$, even when q_m and $q_{m,CF} < 1$. If we accept this interpretation of the results in Panel A, then all four sets of results support Hypothesis 7 — $(q_m < 1) \Rightarrow (q_{m,CF} < 1, q_{m,D} < 1, q_{m,E} < 1)$, in the presence of weak external capital markets.

Hypothesis 8 asserts that $(q_m < 1) \Rightarrow (q_{m,D} > q_{m,CF}$ and $q_{m,D} > q_{m,E})$ when external capital markets are weak. This hypothesis is fully supported in all four country groups. In the Anglo-Saxon and Germanic countries reinvested cash flows earn the lowest returns, while in the Scandinavian and French-origin countries it is new equity issues that have the lowest returns. The bottom three entries in Panel A of Table 7 present separate estimates of q_m for the three sources of investment funds for our samples of transition and African countries and China. The weakness of the corporate governance systems in each category is again revealed by the very low returns on investments made out of cash flows. Somewhat surprisingly perhaps, $\hat{q}_{m,D} \geq 1$ at the 5 percent level, in all three cases, and $\hat{q}_{m,E} \geq 1$ for both the transition and African countries. We suspect that

this finding is not due to the fact that these countries have strong *domestic* external capital markets, but rather that companies in transition and African countries that raise external capital do so abroad or from foreign investors trading in their countries, and thus are effectively subjected to stronger capital market discipline than one might expect. Capital market institutions in China, on the other hand, do not appear to offer much protection to purchasers of new equity issues. Our samples are so small and contain so few companies for which $q_m \geq 1$, that we have not undertaken any further analysis of these three country groups.

B. The Effects of Accounting Standards

The results presented in Panel A of Table 7 imply that none of the four major categories of different legal institutions generates sufficiently strong external capital markets to force even companies with poor overall investment performance to earn returns on new debt and equity issues equal to their costs of capital. In this and the following subsection we thus present further tests of our hypotheses relating to external capital market discipline using two alternative measures of the strength of this discipline.

Shareholders should be able to protect themselves better against self-serving managers and to make better decisions regarding the purchase of new equity issues, the better the quality of accounting information at their disposal. *The Center for International Financial Analysis and Research* (Bavishi, 1993) has examined the accounting practices in a large sample of countries and ranked them according to the number of desirable pieces of information each country's standards require to be published. The scale of this index for the countries in our study runs from a low of 36 for Portugal to a high of 83 for Sweden with a median of 64. We have classified any country with a score of 64 or more as having a strong set of accounting standards, with a score of 63 or less as having weak accounting standards.[24] Our expectation is that returns on cash flows and new equity are relatively higher in countries with strong accounting standards. It is possible, of course, that an improvement in equity's performance comes to some extent at the expense of debt holders, and not simply from a reduction of managerial discretion and an improvement in investment performance. We shall also be interested, therefore, in seeing whether strong accounting systems are associated with *lower* returns on investment financed through new debt issues.

Our estimates of the returns on investments out of the three sources of funds for the two categories of accounting standards are presented in Panel B of Table 7. The number under the coefficient estimates for the weak-accounting-standards countries is the p-value of a test against

one. The number under the coefficient estimates for the strong accounting standards countries is the p-value of a test that the sum of the coefficients of weak and strong accounting standard countries is equal to one, whereas a * indicates that the coefficient estimate is significantly different from zero at the 1% level.

The results for all four country groups are in line with our expectations. Eleven of the twelve $\hat{q}_{m,CF}$s for countries with strong accounting standards are larger than the $\hat{q}_{m,CF}$s for countries with weak standards, five of them significantly so. Eleven of the twelve $\hat{q}_{m,E}$s for countries with strong accounting standards are larger than the $\hat{q}_{m,E}$s for countries with weak standards, five significantly so. Thus, the existence of strong accounting standards appears to strengthen the hand of shareholders resulting in higher returns on both reinvested cash flows and new equity issues, and this holds more or less regardless of a country's legal origin.[25] There is also a suggestion that the improvement in performance for equity holders comes to a degree at the expense of debt holders. Nine of the twelve $\hat{q}_{m,D}$s for countries with strong accounting standards are smaller than the $\hat{q}_{m,D}$s for countries with weak standards, one of these differences is significant at the five percent level, two others at the 10 percent level.

We conclude that the existence of strong accounting standards does improve the investment performance of companies as far as shareholders are concerned. At the same time it must be noted that strong accounting standards alone do not suffice to produce a strong external capital market for equity, as defined in Hypothesis 6. When $q_{m,I}<1$, $q_{m,E}<1$ in all four country groups, even for countries with strong accounting standards.

C. The Effects of Creditors' Rights

Countries' legal institutions differ both with respect to the protections that they offer to equity holders, and the protections that they afford debt holders. In the previous subsection, we examined the impact of one legal institution that particularly impacts equity holders, in this subsection we examine the effects of legal protections for debt holders.

LLSV (1998) have examined the rights of creditors in different countries and ranked them on a scale of one to four, with four representing the strongest rights. Using this index we have classified any country with a score of 3 or 4 as having strong creditor rights, with a score of 1 or 2 as having weak creditor rights.[26] We anticipate superior performance on investments made out of new debt issues in countries with strong creditor rights, and possibly poorer performance for

investments financed out of cash flows or new equity issues in these countries.

Our tests of these predictions are presented in Panel C of Table 7, which should be interpreted analogously to Panel B. The results are once again in line with our expectations. Nine of the twelve $\hat{q}_{m,D}$s for countries with strong creditors' rights are larger than the corresponding $\hat{q}_{m,D}$s for countries with weak creditors' rights. The fact that only two of these nine differences are statistically significant can be attributed to the $\hat{q}_{m,D}$s already being equal to or greater than one in several cases even in the countries with weak creditors' rights. There is also evidence that improved protection for debt holders harms new equity holders. Eleven of the twelve $\hat{q}_{m,E}$s for countries with strong creditors' rights are smaller than the $\hat{q}_{m,E}$s for weak rights, with six of these differences being statistically significant. No systematic differences related to creditors' rights were observed in the patterns of returns on investments out of cash flows, however.

We conclude that strong creditor rights do tend to benefit debt holders and harm purchasers of new equity in all four country groups. Moreover, in the Germanic and Scandinavian groups the condition for a strong external capital market is fulfilled with respect to new debt, $q_m < 1$, but $q_{m,D}$ is insignificantly different from 1.0, when creditor rights are strong.

VI. Conclusions

Our study holds differences in corporate governance institutions, ownership structures and external capital market constraints to be important in explaining differences in company returns on investment relative to their costs of capital, q_{m}. Of these three sets of institutions, the origins of a country's legal system proved to be the most important. The hypothesis that English-origin legal systems produce corporate governance systems that better protect shareholders against managers than other systems found support in our data. The null hypothesis that returns on investment were at least as great as company costs of capital failed to be rejected for the English-origin countries, but was rejected for every other country group. The null hypothesis was rejected for more than half of the individual countries examined. However, the rejection rate was much lower for the two strongest corporate governance systems (10 of 20 countries) than for the weakest systems (20 of 27 including China).

In general, differences in investment performance related to country legal systems dominated differences related to ownership structure. In each of the five ownership categories, companies in countries with English-origin legal systems earned returns on investment equal to or greater than their costs of capital. The same can be said for only three of 20 estimates of

investment returns by ownership category in the four country groups with non-English-origin legal systems. In the three Asian countries with German-origin legal systems *no* ownership category had a significantly better investment performance than for the other firms in these countries. Within the countries with non-English-origin legal systems, neither control by a financial firm nor by another non-financial company sufficed to ensure that returns on investment equalled company costs of capital. Nor did control by a family raise q_m to 1.0 in the Scandinavian and Germanic-European countries and the French-origin countries.[27] In contrast, within the English-origin countries the estimate of q_m for family-controlled firms was both greater than 1.0 and higher than for any other ownership category in this country group. This result also illustrates the importance of a country's corporate governance legal institutions in determining its investment performance. Strong corporate governance institutions help to align managerial and shareholder interests, and prevent dominant individual or family shareholders from exploiting minority shareholders.

Although differences in ownership structures appear to be less important in determining investment performance than differences in the legal environments in which corporations operate, we did find some differences in performance related to ownership structures that exceeded those linked to legal systems. The difference in estimated q_m between the English- and French-origin legal systems was 0.43 (1.02-0-59). The differences between companies with widely dispersed shareholdings and other companies in the Scandinavian and Germanic-European countries were respectively 0.46 and 0.76. We hypothesized that this occurred, because companies in countries with weak corporate governance institutions will not issue large numbers of shares to outsiders unless they can convince them that they will earn attractive returns. Companies with widely dispersed shareholdings in the Scandinavian and Germanic-European countries may also earn higher returns on investment, because they have extensive operations in countries like Great Britain and the United States and thus are effectively subject to English-origin legal systems.

Control by the state was also found to have dramatically different effects on investment performance between the three Germanic-European and French-origin countries. State-controlled companies in Austria, Germany and Switzerland earned returns on their investment of only 37 percent of their cost of capital, while state-controlled companies in French-origin countries had estimated returns insignificantly different from their costs of capital.

We also presented considerable evidence that the entrenchment of managers in companies worsened their investment performance. Returns on investment relative to costs of capital for U.S. companies fell as management's shareholdings increased over a range of concentration levels running from 22 to 68 percent. Cross-shareholdings were associated with significantly worse

investment performance in both Europe and the Japan

We have provided considerable evidence that external capital markets can provide additional constraints on managers to those created by corporate governance systems. The more explicit contractual relationship between firms and debt holders than between firms and equity holders, and the greater scope for debt holders to penalize managers who renege on these contracts leads to higher returns on investments made out of new debt than out of either reinvested cash flows or new equity issues for companies with $q_m < 1$. A *hierarchy of finance* with respect to the returns on investment exists for these companies that differs from that usually postulated in the determinants of investment literature, new debt earns the highest returns. Because of the explicit nature of the contractual relationship between firms and debt holders, the returns on debt were only modestly higher in countries with strong creditors rights than in countries with weak rights. Strengthening accounting standards, on the other hand, often had a significant impact on the returns on cash flows and new equity issues almost regardless of a country's other legal institutions. The estimated q_m for investments out of cash flows was roughly 0.50 higher in the full samples of companies in the English- and German-origin countries, and was also significantly higher for investments out of new equity issues in these and the French-origin countries.

One important conclusion that can be drawn from this study is obviously that agency problems exist in all countries and can have significant impacts on the investment performance of companies. A second, more comforting conclusion is that agency problems can be mitigated by the institutional structures of a country. Legal institutions that strengthen shareholder rights do bring about superior investment performance. Strengthening external capital market constraints can also increase returns on investments out of externally raised finance.

Appendix A: Balance Sheet and Income Statement Data and Calculation of Variables

Data are taken from the 1997 version of the *Standard and Poors' Compustat* (*CS*) for USA and Canada and from the 1996-2001 versions of the *Global Vantage* (*GV*) for all countries. These datasets contain balance sheet, income statement, and stock market information. The sample period for the data is from 1985 through 2001. We exclude all banks and financial companies (SICs 6000 through 6999) and some service industries (SICs above 8100) because the nature of capital and investment in these industries is not comparable to those in non-financial companies. Table A1 table gives an overview of the sample composition by industry and country group. The majority of the sample firms (55 %) are in manufacturing industries, utilities are 11 % of the sample firms and 11 % come from the agriculture, construction, or mining sector, and the rest from services.

Table A1: Composition of the Sample

Country group	Agriculture (< 1000)	Mining (1000-1499)	Construction (1500-1999)	Manufacturing (2000-3999)	Utilities (4000-4999)	Services (>5000)
English	0.80%	8.50%	2.40%	51.20%	10.90%	26.20%
German	0.30%	0.60%	8.80%	66.20%	8.10%	15.90%
French	1.60%	2.80%	5.00%	59.20%	12.70%	18.70%
Scandinavian	0.00%	3.10%	3.80%	60.70%	16.70%	15.70%
Africa	3.60%	20.00%	0.00%	7.30%	67.30%	1.80%
Transition	1.10%	8.90%	7.80%	51.40%	22.30%	8.40%
China	0.80%	1.70%	5.00%	69.40%	19.00%	4.10%
Total	0.80%	6.60%	3.80%	54.60%	10.70%	23.60%

The variables (*CS* data item numbers in parentheses) are as follows. The market value is defined to be the sum of the market value of common stock, the book value of total debt and preferred stock. The market value of common stock is the end-of-fiscal year number of shares (54) multiplied by the end-of-fiscal year price per share (199). We use the book value of total debt (9+34) instead of its market value. An accurate estimate of the market value of a firm's outstanding debt obligations requires knowledge not only of the associated coupon and maturity structure but also of the credit quality of each component. Because such information is not available from standard data sources, we use the book values. The preferred stock is taken to be, in order and as available, redemption value (56), liquidating value (10), or par value (130). The investment of a firm in year *t* is meant to represent all funds available to the company, which could have been paid out directly to shareholders but were instead retained. Thus, investment in year *t* is defined as

$$I = IB + DEP - DIV + \Delta Debt + \Delta Equity + R\&D + ADV$$

where *IB* (18) is income before extraordinary items (profits after taxes and interest), *DEP* (14) is accounting depreciation and *DIV* (21) is total dividends paid in the fiscal year. These come directly from the annual income statements of each company. New debt ($\Delta Debt$) is derived by taking the change in total debt since the previous period. Net new equity ($\Delta Equity$) is calculated as sales (108) less purchases (214) of common and preferred stock. Where these items are not available, $\Delta Equity$ is approximated by the change in the number of common shares outstanding multiplied by the average share price ((197+198)/2).

$R\&D$ expenditures (46) are reported on *CS* and *GV* databases for many companies. Missing values are interpolated from surrounding values on the premise that $R\&D$ to sales ratios are fairly constant over short periods of time, or approximated using $R\&D$ data at the 3-digit SIC code level from the *FTC's Annual Line of Business Reports*.

Advertising expenses (45) are not reported on GV database. For all countries (except for USA and Canada) these are proxied using aggregate advertising-to-sales ratios at the 4-digit SIC code level from a recent study by Rogers and Tokle (1993) who use firm level data from *Leading National Advertisers* to compute 4-digit advertising sales ratios. The remaining advertising figures are approximated by multiplying the actual company sales by 2-digit advertising to sales ratios that come from the 1990 *IRS Reports on Corporation Returns* (Table 6-Balance Sheets, Income Statements, Tax, and Selected Other Items, by Major Industry).

All variables are deflated using the *CPI* (1995=1.00). The main data source for the *CPI* is the latest version of the *International Financial Statistics* maintained by the *Austrian Institute of Economic Research (WIFO).*

Appendix B: Ownership and Control: Sources and Concepts

1. United States of America

The percentage of insider ownership for US firms is provided by the *Compact Disclosure* (*CD*) database. The sole source of ownership data used by *CD* is the *Securities and Exchange Commission*'s corporate proxy statement. Insider ownership is defined as the total number of shares held in aggregate by all officers and directors. We obtain the percentage of total shares held by insiders by dividing this total by the number of shares outstanding. This comprehensive measure of insider ownership has several advantages over alternative measures as for example inferring insider ownership by aggregating individual holdings. First, it incorporates ownership stakes of officers and directors whose individual stakes are smaller than 5% of the outstanding shares. Second, it alleviates the need to trace each beneficial owner's association with the firm. See Anderson and Lee (1997) for a comparison of different ownership sources and measures. Finally, we were able to compile an unbalanced panel for 3,005 firms in total over the years 1988 – 1997. The median number of annual observations per firm is seven (mean 6.2; max 10). The mean (median) value of total insider holdings over all firms and years is 21.06 % (14.22%). For a breakdown over time, see Table A2.

Percentage holdings of shareholders that have significant power to exercise influence over corporate affairs or decisions for the USA are obtained from item 12 of form 10-K.

Table A2. Insider ownership in the USA

Year	Mean	S.D.	Median
1988	19.23	20.35	12.32
1989	21.78	20.93	15.23
1990	21.72	20.91	15.72
1991	21.21	20.90	14.13
1992	21.05	20.38	14.58
1993	20.22	19.76	13.97
1994	21.20	20.35	14.59
1995	21.69	20.76	14.86
1996	21.55	21.10	14.00
1997	18.10	19.61	11.48
All	21.06	20.59	14.22

2. Europe

2.1 Germany

The data on the ownership structure of the German sample firms have been gathered from the 1988, 1991, 1994, and 1997 editions of the *Wer gehört zu wem*, a publication of the German

Commerzbank that offers information on the identities and percentage shareholdings of firm owners. Since this source of data is available every fourth year, we use the most recent ownership data for missing years, e.g., the 1995 data are taken from the 1994 edition and the 1996 data from the 1997 edition. We cover 359 German firms. This procedure is unlikely to introduce much error since the ownership structure of German companies has been very stable.

2.2. Europe other than Germany

The ownership data on all other European countries come from the December 1999 version of *AMADEUS*. *AMADEUS* is a Pan-European financial database, containing balance sheet and ownership information on over 220,000 major public and private companies in all sectors in 26 European countries.[28] To be included in *AMADEUS* companies must comply with at least one of the following criteria: (i) their turnover must be greater than 10 million Euro, (ii) the number of their employees must be greater than 150; and (iii) their total assets must be greater than 10 million Euro. The sources of the ownership information are mostly the annual company reports. Information provided includes the percentage holdings of shareholders holding more than 5% (for the UK the cut off point is the 1% level), the name of the owner, and the date of the filing. In total we categorized 330,941 owners to one of the following owner identities: families/individuals, non-financial firm, financial firm, foreign firm, the state, and dispersed owners, defined as owners holding less than 5% of the equity. In addition, we were able to rebuild the company pyramids, since *AMADEUS* assigns a company key to all owners in the database, provided these are also among the 220,000 companies fulfilling the criteria above. Thus, we are confident that we capture the most important aspects of the ownership and control structure, like the share concentration and identity of the most important direct owners, the pyramidal structure, the deviation from one-share-one-vote due to pyramiding, and cross-shareholdings (see below for a detailed explanation of these concepts.) We could match 2,890 firms with complete information on the ownership and control structure to our *CS/GV* databases.

We supplement *AMADEUS* data for Italy by information provided by *CONSOB* (Document published by the *CONSOB* as per art. 1/5 of Law 216/74,1998) and we make use of the annual reports obtained from *www.huginonline.com* for the missing data on Scandinavian companies.

Salient features of many corporate governance systems involve pyramiding, cross-shareholdings, and large controlling stakes of families, financial and industrial firms, and the state. Pyramiding potentially induces a wedge between cash flow and voting rights. Suppose, for example an ultimate shareholder (*X*) owns α fraction of the shares of corporation *A*, which owns

β fraction of another corporation *B*, which in turn owns γ fraction of corporation *C*. Provided that *X* has "control" at each layer of the pyramid, one way to measure her voting rights in *C* is to use the last direct stake in the pyramidal chain. The fraction of her cash flow rights is only $\alpha \cdot \beta \cdot \gamma$. With for example $\alpha = \beta = \gamma = 1/2$, *X* has the majority control of corporation *C*, whereas the cash flow rights amount just to 12.5 percent. The cash flow rights to voting rights ratio, *CRVR* is equal to 0.25 (=12.5%/50%) and we code *VR=0*. The number of pyramidal layers above *C* is three, that is *X* controls *C* via two other corporate vehicles *A* and *B*, and we code *PYRM=1*.

To explain our concept of cross-shareholdings, suppose now that corporation *A* owns α fraction of corporation B, which in turn owns β fraction of A, where $\alpha, \beta \geq 25\%$. Either *A* or *B* or both control *C*, our sample firm. Then we would say that *C* is ultimately controlled via a cross-shareholding construction, i.e. *CROSS* = 1.

Table A3 presents summary statistics on pyramiding and the *CRVR* ratio. On average, our sample firms operate at the 2.11^{th} layer of corporate pyramids. Nearly 30% of the firms are in the third or lower down layers. The mean ratio of cash flow to voting rights is 0.84. Perhaps as expected, the least deviation of this ratio is found for the UK (0.97). On average, around 30% of firms have no deviation of cash flow from voting rights.

Table A3. Europe: Pyramiding and the deviation of cash flow from voting rights

Country	Pyramidal Layers	Percentage of firms lower than 2	Mean *CRVR*	Percentage of firms *CRVR*=1
Austria	2.03	20.0%	0.928	40.4%
Belgium	2.68	42.1%	0.659	25.0%
Finland	1.98	10.0%	0.881	33.8%
France	2.13	22.8%	0.748	31.2%
Germany	2.13	36.1%	0.763	21.6%
Greece	2.47	29.4%	0.868	66.7%
Ireland	2.10	14.3%	0.833	18.4%
Italy	2.00	10.3%	0.888	13.2%
Luxembourg	3.00	33.3%	0.957	20.0%
Netherlands	2.29	22.1%	0.844	37.9%
Norway	2.63	40.0%	0.779	27.4%
Portugal	2.38	28.6%	0.729	33.3%
Spain	2.36	28.0%	0.757	36.6%
Sweden	2.10	27.4%	0.701	30.3%
Switzerland	1.99	20.5%	0.842	31.7%
United Kingdom	1.94	8.4%	0.968	29.8%
All	2.11	27.8%	0.839	29.1%

3. Japan and East Asian Countries

Our ownership data for Japan are collected from the 1985, 1988, 1991, 1995, and 1997 issues of the Japan Company Handbook which lists the identities and percentage holdings of the10 largest shareholders and the names of the chairman and the president of the company. The information on business group membership is gathered from the 1990/91, 1992/93, 1995/96, 1996/97 issues of *Industrial Groupings in Japan*. This source rates the degree of inclination of companies to eight of the major business groups in Japan (Mitsubishi, Mitsui, Sumitomo, Fuyo, DKB, Sanwa Tokai and IBJ Groups). The degree of inclination is rated on a scale of four, four indicating the strongest degree and depends on the total group's shareholding among the ten largest owners. It also considers the sources and amounts of bank loans, the number of directors sent from the group and other characteristics including the historical background of the group/company relationship. We consider companies with a strong inclination (rating 3 and 4) as group members. Our results are robust to a broader definition (including those rated with 1 and 2) or to Nakatani's (1984) refinement of this list, which selects firms in the largest six groups and eliminates firms switching groups.

4. Rest of the world

We use the 1991, 1994, 1995/96, 1997 issues of the *Asian Company Handbook* to determine the ownership structure of the East Asian countries in the sample (China, Hong Kong, India, Indonesia, Malaysia, Philippines, Singapore, South Korea, Taiwan and Thailand). Similar to the *Japan Company Handbook* these publications list the identity and percentage shareholdings of the major owners of the companies in these countries along with the names of the important executives (president and chairman), which enables us to designate the shareholders as insiders. For some of the missing information on Indian companies, we use the corporate filings at the *Mumbai Stock Exchange*.

For Canada, we use the *FP Survey of Industrials*, which gives the identities, and percentage shareholdings of the major owners.

For the ownership structure of companies from Argentina, Brazil, Mexico and Venezuela, we consult the 1995/96 edition of the Argentina, Brazil, Mexico and Venezuela Company Handbooks published by the *I M F Editora Ltda. RJ, Brazil*. This publication lists the major shareholders, their percentage shareholdings and the names of the major executives of Latin American companies. Several issues from 1997 and 1998 issues of *AmericaEconomia*, are used to cover companies not listed in the above publication.

For companies from Australia, New Zealand, South Africa, we use the 1995/1996 edition of *Major Companies of the Fareast & Australasia* from *Graham & Whiteside*.

Ownership structure of Turkish companies is determined by using the 1995 and 1997 editions of the *Yearbook of Companies* from the Istanbul Stock Exchange.

We use the information on the ownership and control structure of firms to categorize firms into one of the following categories: family-controlled, financial firm-controlled, non-financial firm-controlled, state-controlled and dispersed. The criterion of categorization is that the largest shareholder of the firm is a family, financial firm, non-financial firm or the state *and* that her stake is larger than 10% of total equity. We define a firm to be in dispersed ownership if the largest shareholder of the firm holds less than 10% of total equity. We also categorize group member companies as non-financial firm-controlled even if the largest shareholder is not a non-financial firm. We repeat all our regressions using the 20% criterion for categorization, however the results are virtually unchanged. It should be noted that the percentage of firms categorized as dispersed in English-origin countries increases to 46.3% when we employ a 20% cut-off. The low percentage of firms categorized as dispersed in the US is due to the inclusion of many small companies.

Table A4 presents percentages of firms broken down into the five control categories (using the10% cut-off) as well as countries and legal systems. We also report the rating on Accounting Standards *(AS*) and Creditor Rights *(CR*). The entries for each legal system report the medians of *AS* and *CR* ratings and the means of our control dummies.

Table A4: Sample Composition by Ownership Category, Country, and Legal System

Country	Accounting Standards	Creditor Rights	Number of Firms	Control				
				Family	Financial	Non-financial	State	Dispersed
Australia	75	1	114	30.7%	17.5%	30.7%	0.0%	21.1%
Bermuda	na	na	12	25.0%	25.0%	50.0%	0.0%	0.0%
Canada	74	1	280	34.6%	19.6%	40.4%	3.3%	2.1%
Cayman Islands	na	na	5	0.0%	0.0%	100.0%	0.0%	0.0%
Great Britain	78	4	687	17.9%	37.0%	15.1%	1.8%	28.2%
Hong Kong	69	4	43	14.0%	34.9%	51.2%	0.0%	0.0%
India	57	4	37	2.7%	2.7%	43.2%	51.4%	0.0%
Ireland	na	1	24	29.2%	20.8%	16.7%	8.3%	25.0%
Israel	64	4	14	28.6%	14.3%	50.0%	0.0%	7.1%
Malaysia	76	4	158	38.0%	10.1%	48.1%	1.9%	1.9%
New Zealand	70	3	18	0.0%	55.6%	44.4%	0.0%	0.0%
Pakistan	na	4	1	0.0%	0.0%	100.0%	0.0%	0.0%
Singapore	78	4	97	27.8%	28.9%	43.3%	0.0%	0.0%
South Africa	70	3	25	24.0%	24.0%	48.0%	4.0%	0.0%
Thailand	64	3	81	7.4%	56.8%	32.1%	3.7%	0.0%
USA	71	1	3,070	47.3%	25.9%	14.6%	0.9%	11.3%
English	71	3.5	4,666	39.2%	26.9%	19.8%	1.7%	12.4%
Denmark	62	3	40	25.0%	12.5%	25.0%	2.5%	35.0%
Finland	77	1	34	5.9%	17.6%	38.2%	23.6%	14.7%
Norway	74	2	42	16.7%	23.8%	47.6%	7.1%	4.8%
Sweden	83	2	54	16.7%	38.9%	33.3%	3.7%	7.4%
Scandinavian	64	2	170	16.5%	24.7%	35.9%	8.2%	14.7%
Austria	54	3	30	6.7%	23.3%	53.3%	16.7%	0.0%
Germany	62	3	240	26.7%	15.4%	48.8%	7.0%	2.1%
Japan	65	2	1,036	5.9%	6.6%	58.1%	0.2%	29.2%
South Korea	62	3	16	25.0%	6.3%	25.0%	12.4%	31.3%
Switzerland	68	1	66	33.3%	10.6%	42.4%	4.6%	9.1%
Taiwan	65	2	11	18.2%	9.1%	9.1%	9.1%	54.5%
German	63.5	2.5	1,399	11.1%	8.6%	54.9%	2.2%	23.2%
Argentina	45	1	8	12.5%	25.0%	50.0%	12.5%	0.0%
Belgium	61	2	41	9.8%	34.1%	53.7%	0.0%	2.4%
Brazil	54	1	25	12.0%	12.0%	56.0%	20.0%	0.0%
Chile	52	2	9	11.1%	44.4%	33.3%	0.1%	11.1%
France	69	0	187	25.1%	17.6%	51.3%	2.3%	3.7%
Greece	55	1	5	0.0%	0.0%	80.0%	20.0%	0.0%
Indonesia	na	4	41	34.1%	9.8%	48.8%	7.3%	0.0%
Italy	62	2	57	3.5%	40.4%	47.4%	3.4%	5.3%
Luxembourg	na	na	3	0.0%	0.0%	66.7%	33.3%	0.0%
Mexico	60	0	8	50.0%	0.0%	50.0%	0.0%	0.0%
Netherlands	64	2	66	6.1%	13.6%	43.9%	6.1%	30.3%
Netherlands Antilles	na	na	5	20.0%	20.0%	60.0%	0.0%	0.0%
Panama	na	na	3	33.3%	33.3%	33.3%	0.1%	0.0%
Peru	38	0	1	0.0%	0.0%	100.0%	0.0%	0.0%
Philippines	65	0	4	0.0%	25.0%	25.0%	50.0%	0.0%
Portugal	36	1	10	0.0%	20.0%	30.0%	50.0%	0.0%
Spain	64	2	59	1.7%	23.7%	57.6%	8.5%	8.5%
Turkey	51	2	5	20.0%	40.0%	40.0%	0.0%	0.0%
Venezuela	40	na	1	100.0%	0.0%	0.0%	0.0%	0.0%
French	54.5	1	538	15.8%	21.0%	50.2%	6.1%	6.9%
China	na	na	2	50.0%	0.0%	0.0%	50.0%	0.0%
Total	64	2	6,775	30.9%	22.6%	29.9%	2.3%	14.3%

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Table 1 Summary Statistics and Sample Composition by Country, 1985- 2000

Country	Sample Period	Number of Firms	$(M_t - M_{t-1})/M_{t-1}$		$Investment_t/M_{t-1}$		CF_t/M_{t-1}		$\Delta Debt_t/M_{t-1}$		$\Delta Equity_t/M_{t-1}$	
			Mean	SD	Mean	SD	Mean	SD	Mean	SD	Mean	SD
Australia	1985-2000	346	0.127	0.512	0.150	0.250	0.041	0.134	0.014	0.146	0.060	0.154
Bermuda	1985-2000	215	0.079	0.532	0.163	0.277	0.055	0.156	0.003	0.169	0.039	0.109
Canada	1985-2000	1478	0.174	0.516	0.175	0.246	0.062	0.112	0.031	0.165	0.055	0.133
Cayman Islands	1985-2000	42	0.151	0.604	0.149	0.238	0.045	0.153	0.018	0.208	0.050	0.129
Great Britain	1985-2000	1331	0.101	0.406	0.172	0.231	0.062	0.084	0.015	0.118	0.049	0.160
HongKong	1985-2000	127	0.089	0.450	0.143	0.237	0.047	0.105	0.018	0.156	0.047	0.133
India	1988-2000	246	0.064	0.444	0.151	0.208	0.056	0.058	0.002	0.104	0.040	0.125
Ireland	1985-2000	63	0.208	0.561	0.216	0.297	0.063	0.089	0.041	0.181	0.058	0.150
Israel	1985-1999	56	0.295	0.644	0.211	0.260	0.056	0.096	0.048	0.195	0.036	0.108
Malaysia	1985-2000	381	0.185	0.546	0.135	0.224	0.048	0.083	0.020	0.136	0.031	0.123
New Zealand	1985-2000	66	0.055	0.362	0.132	0.263	0.064	0.072	0.008	0.182	0.024	0.100
Pakistan	1993-2000	46	-0.043	0.310	0.236	0.352	0.088	0.123	-0.010	0.171	0.014	0.062
Singapore	1985-2000	208	0.139	0.527	0.138	0.193	0.056	0.077	0.014	0.130	0.032	0.099
South Africa	1985-2000	118	0.115	0.529	0.147	0.187	0.094	0.095	0.008	0.092	0.019	0.083
Thailand	1986-2000	243	0.057	0.472	0.195	0.296	0.072	0.129	0.021	0.165	0.046	0.177
USA	1985-2000	8591	0.125	0.448	0.146	0.213	0.059	0.098	0.022	0.148	0.017	0.103
English	1985-2000	13557	0.127	0.504	0.154	0.237	0.046	0.122	0.022	0.152	0.035	0.127
Denmark	1985-2000	101	0.054	0.385	0.199	0.226	0.087	0.073	0.006	0.119	0.033	0.145
Finland	1985-2000	79	0.095	0.408	0.151	0.191	0.089	0.065	-0.004	0.145	0.018	0.073
Norway	1985-1999	103	0.097	0.442	0.167	0.226	0.073	0.082	0.014	0.155	0.039	0.123
Sweden	1985-2000	156	0.115	0.410	0.195	0.270	0.080	0.068	0.005	0.143	0.051	0.186
Scandinavian	1985-2000	439	0.104	0.424	0.183	0.247	0.081	0.076	0.006	0.140	0.038	0.150
Austria	1985-2000	82	0.021	0.367	0.211	0.282	0.105	0.098	0.014	0.159	0.032	0.152
Germany	1985-2000	425	0.049	0.335	0.235	0.262	0.108	0.114	0.008	0.129	0.024	0.106
Japan	1985-2000	2219	0.059	0.336	0.111	0.143	0.037	0.046	0.022	0.098	0.016	0.053
South Korea	1988-1999	82	0.302	0.492	0.289	0.311	0.065	0.161	0.131	0.274	0.029	0.057
Switzerland	1985-2000	160	0.108	0.374	0.209	0.268	0.101	0.092	0.004	0.140	0.025	0.134
Taiwan	1988-1999	126	0.067	0.456	0.155	0.193	0.042	0.047	0.026	0.090	0.062	0.150
German	1985-2000	3094	0.066	0.350	0.137	0.188	0.051	0.071	0.021	0.113	0.021	0.079

Table 1 (Continued) Summary Statistics and Sample Composition by Country, 1985- 2000

Country	Sample Period	Number of Firms	$(M_t - M_{t-1})/M_{t-1}$		$Investment_t/M_{t-1}$		CF_t/M_{t-1}		$\Delta Debt_t/M_{t-1}$		$\Delta Equity_t/M_{t-1}$	
			Mean	SD	Mean	SD	Mean	SD	Mean	SD	Mean	SD
Argentina	1989-2000	24	0.046	0.361	0.257	0.318	0.128	0.188	0.055	0.154	0.030	0.180
Belgium	1985-2000	79	0.058	0.327	0.233	0.326	0.102	0.076	0.007	0.157	0.017	0.095
Brazil	1989-2000	133	0.135	0.637	0.125	0.326	0.064	0.208	-0.006	0.102	0.020	0.162
Chile	1988-1999	73	0.089	0.433	0.161	0.169	0.088	0.074	0.032	0.103	0.027	0.091
Colombia	1989-1999	15	0.000	0.570	0.131	0.172	0.083	0.121	0.017	0.130	0.006	0.021
France	1985-2000	495	0.066	0.347	0.222	0.265	0.106	0.097	0.002	0.148	0.029	0.114
Greece	1988-1999	49	0.535	0.684	0.418	0.448	0.083	0.065	0.034	0.143	0.269	0.422
Indonesia	1989-1999	132	0.143	0.542	0.194	0.305	0.045	0.135	0.049	0.182	0.054	0.176
Italy	1985-2000	150	0.058	0.324	0.187	0.256	0.099	0.082	0.004	0.171	0.026	0.104
Luxembourg	1986-2000	12	0.139	0.464	0.198	0.191	0.106	0.080	0.040	0.132	0.029	0.130
Mexico	1986-1999	81	0.100	0.448	0.198	0.247	0.099	0.118	0.031	0.145	0.028	0.117
Netherlands	1985-2000	174	0.095	0.357	0.227	0.235	0.110	0.074	0.017	0.125	0.034	0.146
Netherlands Antilles	1985-2000	19	0.142	0.325	0.105	0.086	0.072	0.040	0.005	0.060	0.001	0.037
Panama	1985-2000	4	0.109	0.363	0.074	0.120	0.052	0.039	0.004	0.118	0.001	0.025
Peru	1992-2000	20	0.068	0.531	0.278	0.381	0.251	0.311	-0.011	0.121	0.005	0.036
Philippines	1985-1999	83	0.090	0.555	0.154	0.267	0.063	0.120	0.024	0.232	0.040	0.102
Portugal	1988-1999	49	0.097	0.421	0.250	0.330	0.098	0.083	0.016	0.168	0.036	0.126
Spain	1985-1999	117	0.096	0.378	0.212	0.304	0.088	0.090	0.011	0.157	0.066	0.207
Turkey	1990-1999	29	0.419	0.829	0.434	0.422	0.225	0.215	0.040	0.124	0.135	0.280
Venezuela	1991-2000	10	-0.123	0.299	0.126	0.158	0.104	0.105	-0.025	0.111	0.026	0.067
French	1985-2000	1748	0.100	0.428	0.210	0.280	0.093	0.109	0.013	0.150	0.039	0.150
China	1994-1999	70	0.034	0.498	0.290	0.378	0.128	0.172	0.044	0.224	0.025	0.128
Transition Countries	1994-1999	85	0.030	0.309	0.210	0.241	0.126	0.123	-0.008	0.146	0.013	0.029
African Countries	1994-1999	17	-0.032	0.285	0.142	0.123	0.115	0.061	-0.002	0.080	0.009	0.018
All	1985-2000	19010	0.113	0.474	0.156	0.234	0.051	0.113	0.021	0.146	0.33	0.122

The group of transition countries includes 85 firms from Czech Rep., Estonia, Croatia, Hungary, Lithuania, Poland, Romania, Russia, Slovakia. The group of African countries includes 17 firms from Gabon, Ghana, Kenya, Liberia, and Zambia.

Table 2 Separate Estimates of depreciation (δ) by industry and returns on investment (q_m) by country

The table presents the results of estimating eq. 4 by constraining (1) all companies in a country, and (2) all companies in a country group defined by legal system to have the same return on investment relative to the cost of capital (q_m). In both cases we allow for individual depreciation rates defined by 2- digit SIC. The first (second) equation has an adjusted R^2 of 0.23 (0. 24). The number of observations is 112,590. All t-values are robust to heteroscedasticity (White, 1980). * indicates the significance level of a Wald test that the estimated q_m is different from 1.00.

Industry	SIC	$-\hat{\delta}$	t-value	Country	$\hat{q}_m$	t-value	$(\hat{q}_m \neq 1)^*$	Obs.	Firms	Country	$\hat{q}_m$	t-value	$(\hat{q}_m \neq 1)^*$	Obs.	Firms
Agriculture, Forestry, Comcl. Fishing	100	-0.0038	-0.34	Australia	0.94	22.01	0.20	2342	346	Austria	0.71	5.82	0.02	461	82
Metal Mining, Oil and Gas Extraction	10-14	0.0484	8.69	Bermuda	0.91	11.08	0.27	821	215	Germany	0.57	16.58	0.00	2740	425
Construction	15-17	0.0121	2.75	Canada	1.16	46.27	0.00	9536	1478	Japan	0.86	32.24	0.00	14874	2219
Food, Kindred Products & Tobacco	20-21	-0.0309	-7.36	Cayman Islands	0.58	3.13	0.02	161	42	South Korea	0.70	9.01	0.00	199	82
Textiles & Apparel	22-23	-0.0261	-4.77	Great Britain	0.85	33.44	0.00	9402	1331	Switzerland	0.64	7.79	0.00	868	160
Lumber, Wood & Furn. and Fixtures	24-25	-0.0072	-0.92	Hong Kong	0.78	8.92	0.01	660	127	Taiwan	1.26	12.32	0.01	354	126
Paper, Allied Products & Print., Publ.	26-27	-0.0035	-0.79	India	0.80	8.20	0.04	906	246						
Chemicals (Without Pharmac.: 283)	28	-0.1446	-27.96	Ireland	1.10	13.87	0.21	362	63	Argentina	0.78	5.09	0.16	86	24
Pharmaceuticals	283	0.0818	8.35	Israel	1.27	6.29	0.18	179	56	Belgium	0.51	7.65	0.00	467	79
Petroleum Refining and Related Ind.	29	-0.0030	-0.38	Malaysia	0.86	17.98	0.00	1809	381	Brazil	0.25	4.09	0.00	379	133
Rubber and Misc. Plastics Products	30	-0.0119	-1.65	New Zealand	0.86	12.36	0.05	328	66	Chile	1.24	5.38	0.29	214	73
Leather and Leather Products	31	-0.0397	-2.57	Pakistan	0.40	4.67	0.00	105	46	Colombia	0.43	2.66	0.00	44	15
Stone, Clay, Glass, Concrete Prd.	32	-0.0134	-2.40	Singapore	0.97	10.31	0.75	1182	208	France	0.57	16.51	0.00	2591	495
Primary Metal Industries	33	-0.0050	-0.97	South Africa	1.07	5.11	0.72	549	118	Greece	0.54	4.50	0.00	113	49
Fabricated Metals	34	-0.0150	-2.52	Thailand	0.64	10.53	0.00	1328	243	Indonesia	0.84	9.50	0.06	516	132
Indrl & Comcl. Machinery, Com. Eq.	35	-0.0069	-1.48	USA	1.05	89.39	0.00	52793	8591	Italy	0.64	13.27	0.00	810	150
El. Machinery, Other Electrical Eq.	36	0.0094	1.89							Luxembourg	0.70	1.50	0.52	56	12
Transportation Equipment	37	-0.0223	-4.35	Denmark	0.65	6.22	0.00	532	101	Mexico	0.50	5.01	0.00	312	81
Measurement Instruments	38	0.0143	2.13	Finland	0.96	9.91	0.69	420	79	Netherlands	0.69	9.83	0.00	1068	174
Misc. Manufacturing	39	-0.0214	-1.95	Norway	1.04	12.64	0.63	511	103	Netherlands Antilles	1.19	8.54	0.17	88	19
Transportation	47	-0.0125	-2.91	Sweden	0.65	6.01	0.00	657	156	Panama	1.25	6.09	0.23	36	4
Communications	48	0.1033	12.33							Peru	0.11	0.88	0.00	45	20
Electric, Gas, Sanitary Services	49	0.0068	1.96							Philippines	1.00	5.26	0.98	249	83
Durable Goods-Wholesale	50-59	-0.0007	-0.23							Portugal	0.46	4.43	0.00	180	49
Services	70	0.0144	3.05							Spain	0.54	10.10	0.00	764	117
										Turkey	0.52	3.89	0.00	75	29
Legal System		$\hat{q}_m$	**t-value**							Venezuela	0.58	2.79	0.04	32	10
English Origin		1.02	111.34												
Scandinavian Origin		0.78	13.67							China	0.45	3.96	0.00	121	70
German Origin		0.74	35.51												
French Origin		0.59	29.23												
Transition Countries†		0.64	4.30												
African Countries†		0.77	10.90												

† The group of transition countries includes 85 firms from Czech Rep., Estonia, Croatia, Hungary, Lithuania, Poland, Romania, Russia, and Slovakia. The group of African countries includes 17 firms from Gabon, Ghana, Kenya, Liberia, and Zambia.

Table 3 The Effects of Ownership on the Returns on Investment (q_m) by Country Group

The table presents the results of estimating eq. 4 by allowing q_m to take on different values depending on both a company's country of origin and its ownership structure. The first entry for each ownership category gives the point estimate of q_m for that category. The second entry is the q_m for the remaining companies in that country group. The > (<) sign between the two numbers indicates that the first entry is greater (smaller) than the second one. The number below the inequality is the level of significance of this difference, the numbers below each entry indicate the p-value of a test that the estimated coefficient is equal to 1. . Entries in bold face indicate differences significant at the 5 percent level, or better (two tailed test). The number of observations is 70,252 and the adjusted R^2 's are about 0.23. All t- tests are based on White (1980) standard errors. All equations include 24 industry dummies (not reported).

	English Origin			**Scandinavian Origin**			**European-German Origin**			**Asian-German Origin**			**French Origin**		
Family	**1.082**	**>**	**1.019**	0.773	>	0.739	0.599	<	0.636	0.987	>	0.872	0.569	<	0.605
	0.00	**0.02**	**0.22**	0.12	0.84	0.00	0.00	0.66	0.00	0.92	0.41	0.00	0.00	0.56	0.00
Financial	**1.002**	**<**	**1.061**	0.561	<	0.812	0.561	<	0.640	0.869	<	0.882	**0.692**	**>**	**0.579**
	0.92	**0.03**	**0.00**	0.00	0.13	0.00	0.00	0.41	0.00	0.32	0.93	0.00	**0.00**	**0.04**	**0.00**
Non-Financial	1.058	>	1.041	0.718	<	0.761	0.626	<	0.628	0.896	>	0.863	0.565	<	0.644
	0.03	0.59	0.00	0.00	0.73	0.01	0.00	0.98	0.00	0.00	0.55	0.00	0.00	0.10	0.00
Dispersed	1.001	<	1.050	**1.145**	**>**	**0.683**	**1.358**	**>**	**0.601**	0.829	<	0.906	0.543	<	0.605
	0.91	0.21	0.00	**0.40**	**0.01**	**0.00**	**0.15**	**0.00**	**0.00**	0.00	0.20	0.00	0.00	0.50	0.00
State	1.014	<	1.045	0.796	>	0.743	**0.374**	**<**	**0.634**	1.322	>	0.880	**0.952**	**>**	**0.588**
	0.91	0.82	0.00	0.40	0.83	0.00	**0.00**	**0.04**	**0.00**	0.37	0.23	0.00	**0.76**	**0.02**	**0.00**

Table 4 The Effects of Insider Ownership Concentration on q_m in the United States

The table reports a nonlinear relationship between q_m and insider ownership *(IO)* for US companies. The coefficient of *IO*, IO^2 , and IO^3 are multiplied with *100*, 100^2 , and 100^3 , respectively. All t-tests are based on White (1980) standard errors. All equations include 24 industry dummies (not reported). See table A2 in the Appendix B for summary statistics on insider ownership.

	$\hat{q}_m$	*IO*	IO^2	IO^3	*N*	Adj. R^2
Coefficient	0.95	2.71	-8.23	6.14	31,698	0.25
t-value	24.91	5.25	4.80	3.99		

Table 5 The Effects of Pyramiding, Cross-Shareholdings and Shareholder Voting Rights in Europe

The table reports the effect of pyramiding *(PYRM*), cross-shareholdings *(CROSS*) and deviations of control and cash flow rights *(VR*). The variable *PYRM* = 1, if a company is two or more levels down in a corporate pyramid, 0 otherwise; *VR* = 1, if the control and cash flow rights of the dominant shareholder are equal, 0 otherwise; and *CROSS* = 1, if a company is part of a group of firms with cross-shareholdings,0 otherwise;. We again interact these three variables with the investment term on the right-hand-side of eq. 4, and include them along with investment in the equation. All t-tests are based on White (1980) standard errors. The equation includes 24 industry dummies (not reported). See table A3 in the appendix B for summary statistics on *PYRM* and *V*R.

	$\hat{q}_m$	*PYRM*	*CROSS*	*VR*	*N*	Adj. R^2
Coefficient	0.68	-0.09	-0.25	0.12	10,993	0.22
t-value	24.74	-2.03	-2.76	2.50		

Table 6 The Impact of Business Groups on the Returns on Investment in Japan

The table reports the impact of group membership on the returns on investment in Japan. The information on the business group membership is gathered from the 1990/91, 1992/93, 1995/96, 1996/97 issues of Industrial Groupings in Japan which rate the degree of inclination of companies to eight of the major business groups in Japan (Mitsubishi, Mitsui, Sumitomo, Fuyo, DKB, Sanwa Tokai and IBJ Groups). We categorize 1047 of the 2219 Japanese firms as affiliated to groups (47.2%). All t-tests are based on White (1980) standard errors. The equation includes 24 industry dummies (not reported).

	1985-2000	*1985-1995*	*1996-2000*
$\hat{q}_m$	0.94	1.07	0.59
t-value	42.27	40.09	15.30
$\hat{q}_m$ *** BG**	-0.11	-0.15	-0.02
t-value	-3.32	-3.73	-0.43
N	12855	9388	3497
Adj. R^2	0.17	0.20	0.14

Table 7 Estimated q_m s by Source of Funds

A. By Legal System

We use eq. 4 by estimating separate coefficients on investment for each source of finance. The first row in each country group gives the estimates for the full sample of companies. The second and third rows present the estimates with the sample divided into companies for which (firm-level) $\hat{q}_m \geq 1$, and for which $\hat{q}_m < 1$ in each country group. The number of observations (Adj. R^2) is 103,722 (0.25) for the full sample, 54,051 (0.34) and 49,671 (0.18) for the $\hat{q}_m \geq 1$ and $\hat{q}_m < 1$ samples, respectively. The p-value of a Wald test that the estimated coefficient is different from 1.0 is provided below the estimates. All equations include 24 industry dummies (not reported).

Legal System	Sample	No (%) of Firms	Median q_m	CF_t / M_{t-1}	$\Delta Debt_t / M_{t-1}$	$\Delta Equity_t / M_{t-1}$
English	All	11,311	1.09	0.86 0.00	1.09 0.00	1.37 0.00
	$q_m \geq 1$	55	1.74	1.48 0.00	1.35 0.00	1.99 0.00
	$q_m < 1$	45	0.51	0.36 0.00	0.77 0.00	0.63 0.00
Scandinavian	All	350	0.85	1.31 0.04	1.08 0.22	0.55 0.00
	$q_m \geq 1$	42	1.56	2.29 0.00	1.42 0.00	1.37 0.00
	$q_m < 1$	58	0.55	0.71 0.03	0.86 0.00	0.21 0.00
German	All	2,476	0.84	0.70 0.00	0.98 0.13	1.09 0.13
	$q_m \geq 1$	39	1.45	1.57 0.00	1.27 0.00	1.59 0.00
	$q_m < 1$	61	0.55	0.47 0.00	0.83 0.00	0.55 0.00
French	All	1,433	0.78	0.64 0.00	1.02 0.50	0.52 0.00
	$q_m \geq 1$	38	1.67	1.39 0.00	1.41 0.00	1.10 0.27
	$q_m < 1$	62	0.46	0.46 0.00	0.84 0.00	0.37 0.00
Transition	All	78	0.76	0.39 0.00	1.25 0.04	1.29 0.34
Africa	All	17	0.71	0.45 0.00	0.90 0.32	1.05 0.78
China	All	48	0.6	0.28 0.00	1.14 0.29	-0.46 0.00

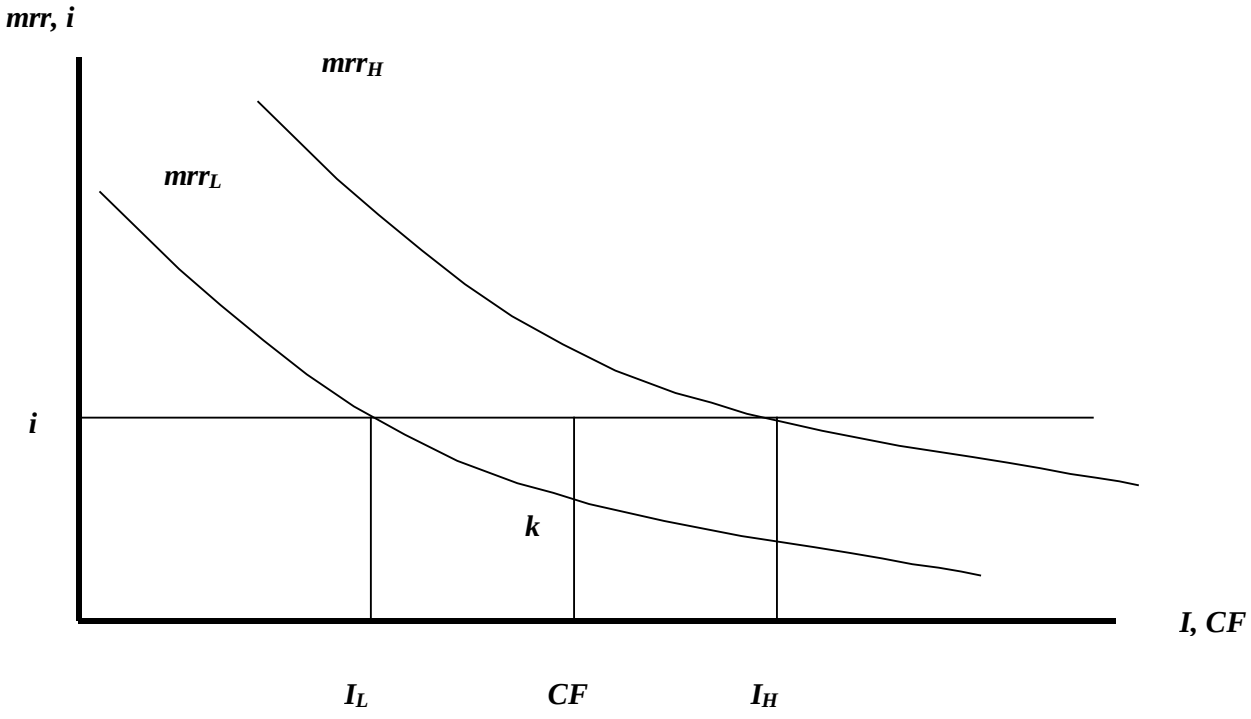
Table 7 (Continued) Estimated q_m s by Source of Funds

Panel B reports our estimates of the returns on investments out of the three sources of funds for weak and strong accounting standards, *(A*S). The number under the coefficients for the weak-*AS* countries is the p-value of a Wald test against one. The number under the coefficients for the strong *AS* countries is the p-value of a Wald test that the sum of the coefficients of the weak AS countries and strong AS countries is equal to one. The number of observations for the full sample is 103,722. The adj. R^2 of the $q_m \geq 1$ ($q_m < 1$) sample is 0.28 (0.14). Panel C repeats the same exercise for strong and weak creditor rights *(C*R). The adj. R^2 of the $q_m \geq 1$ ($q_m < 1$) sample is 0.29 (0.15). All t-tests (below the coefficients) are based on White (1980) standard errors. All equations include 24 industry dummies (not reported).

Legal System	*Sample*	*AS / CR*	**Panel B**			**Panel C**		
			CF_t / M_{t-1}	$\Delta Debt_t / M_{t-1}$	$\Delta Equity_t / M_{t-1}$	CF_t / M_{t-1}	$\Delta Debt_t / M_{t-1}$	$\Delta Equity_t / M_{t-1}$
English	All	Weak	0.83*	1.02*	1.07*	1.32*	1.05*	2.06*
			0.23	0.74	0.60	0.00	0.00	0.00
	All	Strong	0.49*	0.02	0.79*	0.02	-0.02	-1.00*
			0.00	0.00	0.00	0.00	0.29	0.20
	$q_m \geq 1$	Weak	1.65*	1.49*	1.69*	1.87*	1.31*	2.54*
			0.04	0.00	0.00	0.00	0.00	0.00
	$q_m \geq 1$	Strong	0.21	-0.19	0.68*	0.20**	0.03	-0.97*
			0.00	0.00	0.00	0.00	0.00	0.00
	$q_m < 1$	Weak	0.37*	0.69*	0.58*	0.65*	0.70*	1.06*
			0.00	0.00	0.00	0.00	0.00	0.13
	$q_m < 1$	Strong	0.28**	0.00	0.33**	0.13**	0.01	-0.48*
			0.00	0.00	0.01	0.00	0.00	0.00
Scandinavian	All	Weak	1.28*	1.04*	0.64*	1.40*	0.97*	1.01*
			0.26	0.73	0.00	0.01	0.71	0.96
	All	Strong	0.11	-0.07	0.37	-0.11	0.07	-0.37
			0.01	0.72	0.01	0.26	0.73	0.75
	$q_m \geq 1$	Weak	1.47**	1.48*	0.69**	2.37*	1.21*	2.19*
			0.42	0.08	0.34	0.00	0.14	0.00
	$q_m \geq 1$	Strong	0.91	-0.26	1.50*	-0.91	0.26	-1.50*
			0.00	0.14	0.00	0.42	0.08	0.00
	$q_m < 1$	Weak	1.23*	0.99*	0.56*	0.72*	0.76*	0.48*
			0.26	0.91	0.00	0.05	0.00	0.00
	$q_m < 1$	Strong	-0.51**	-0.23***	-0.09	0.50**	0.23***	0.09
			0.05	0.00	0.00	0.26	0.91	0.09
German	All	Weak	0.59*	0.99*	1.03*	1.09*	0.94*	1.33*
			0.00	0.80	0.69	0.08	0.04	0.00
	All	Strong	0.50*	-0.04	0.30*	-0.50*	0.04	-0.30*
			0.07	0.04	0.00	0.00	0.80	0.69
	$q_m \geq 1$	Weak	0.81*	1.10*	1.58*	2.01*	1.26*	1.77*
			0.14	0.22	0.00	0.00	0.00	0.00
	$q_m \geq 1$	Strong	1.20*	0.17***	0.19	-1.20*	-0.16***	-0.19
			0.00	0.00	0.00	0.13	0.22	0.00
	$q_m < 1$	Weak	0.58*	0.89*	0.66*	0.62*	0.72*	0.72*
			0.00	0.01	0.00	0.00	0.00	0.00
	$q_m < 1$	Strong	0.04	-0.17*	0.06	-0.04	0.17*	-0.06
			0.00	0.01	0.00	0.00	0.01	0.00
French	All	Weak	0.68*	1.05*	0.65*	0.78*	1.04*	0.78*
			0.00	0.29	0.00	0.00	0.23	0.00
	All	Strong	0.19***	0.00	0.15	0.07	0.14	-0.36
			0.09	0.27	0.01	0.47	0.13	0.02
	$q_m \geq 1$	Weak	1.38*	1.48*	0.88*	1.45*	1.41*	1.08*
			0.02	0.00	0.54	0.00	0.00	0.48
	$q_m \geq 1$	Strong	0.18	0.00	0.28	0.59	0.42	-0.78*
			0.00	0.00	0.20	0.05	0.00	0.43
	$q_m < 1$	Weak	0.47*	0.83*	0.52*	0.55*	0.85*	0.54*
			0.00	0.00	0.00	0.00	0.00	0.00
	$q_m < 1$	Strong	0.11	0.03	0.00	-0.14	-0.01	-0.18
			0.00	0.00	0.00	0.00	0.13	0.00

Figure 1 Investment consistent with shareholder wealth maximization

The marginal returns on investment (*mrr*) schedule and the cost of capital (*i*) are given along the vertical axis, investment outlays (*I*) and cash flow (*CF*) on the horizontal axis. A company with mrr_H and internal cash flows *CF*, maximizes shareholder wealth by investing I_H and raising ($I_H - CF$) externally. Its marginal return (mrr_H) on investment will be equal to the cost of capital (*i*), its average return on investment, *r*, will be greater than *i* making $q_m = r/i > 1$.



Notes:

[1] See Fazzari, Hubbard and Petersen (1988), Hoshi, Kashyap and Sharfstein (1991).

[2] See Baumol, Heim, Malkiel and Quandt (1970, hereafter BHMQ), Grabowski and Mueller (1975), Shinnar, Dressler, Feng and Avidan (1989), and Mueller and Reardon (1993).

[3] See, Schiantarelli and Sembenelli (2000), Shin and Park (1999).

[4] See, Levine and Zervos (1998), Rajan and Zingales (1998), La Porta, Lopez de Silanes, Shleifer and Vishny (2000).

[5] Later we shall distinguish among the q_ms for investments out of different sources of finance using subscripts.

[6] See, Baumol (1959), Marris (1964), Grabowski and Mueller (1972, 1975).

[7] For further discussion and evidence see, Claessens, Djankov, and Lang (2000) and Gugler and Yurtoglu (2001).

[8] For evidence that dominant owners do exploit minority shareholders in countries with weak corporate governance systems, see Doidge, Karolyi and Stulz (2001).

[9] For examples and discussion, see Gugler (2001).

[10] See, Edwards and Fischer (1994).

[11] See, Backman (2001) and Economist (1998).

[12] The methodology is developed by Mueller and Reardon (1993).

[13] Although both the market value of the firm, *M*, and its investment, *I*, carry a *t* subscript, equation (4) does not suffer from a simultaneous equation bias. M_t is a company's market value at the *end* of year *t*, while I_t is the investment flow over year *t*. Thus, I_t is measured *before* M_t and can be treated as exogenous.

[14] A possible bias in estimating the returns on investment relative to the cost of capital using (4) arises, if the market anticipates the investments to be made in the future *and* the returns on them. Equation (4) accurately estimates q_m, even if the market correctly anticipates these investments at *t -1*, if the expected returns on future investments equal a company's cost of capital *(r=i*). The methodology will yield lower (higher) estimates of q_m and δ, if at *t* -1 the market correctly anticipates investment at *t* with returns *r> i (r<i)*. See Mueller and Yurtoglu (2000) for a detailed discussion and evidence that there is no systematic bias in our estimates.

[15] See Shiller (1981, 2000).

[16] We have added Bermuda and the Cayman Islands to LLSV's set of English-origin countries and Luxembourg to the French-origin group.

[17] Consistently, Doidge et al. (2001) find that foreign companies listed in the U.S. have a greater Tobin's *q* ratio than firms from the same country that are not listed in the U.S.

[18] In the French-origin countries, companies controlled by other non-financial firms have significantly *lower* returns on investment than other ownership groups, when a 10 percent cut-off for significance is used.

[19] It is worth noting that the standard error of the estimate of q_m is larger for state-controlled companies than for other ownership categories in all five country groups. Thus, the investment performance of state-controlled companies appears to be much more heterogeneous than for other ownership categories.

[20] A similar nonlinear pattern has been observed between *q* and insider ownership concentration by Cosh, Guest and Hughes (2000).

[21] We use the classification contained in the Industrial Groupings in Japan (1990/91 - 1996/97). See Appendix B for details.

[22] Since we control for returns on total investment in Table 7, we do not separate the German-origin countries into the three European and three Asian countries. In the German-origin group, most of the companies with $\hat{q}_m \geq 1$ come from the Asian countries, however, while the preponderance of firms with $\hat{q}_m < 1$ coming from Europe.

[23] These firm-level $\hat{q}_m$ are obtained by estimating an equation which includes 24 industry dummies and investment-firm dummy interactions.

[24] The index is based on the examination of 1990 annual reports on the inclusion or omission of 90 items. These fall into seven categories: general information, income statements, balance sheets, funds flow statement, accounting standards, stock data, and special items. Our breakdown of the countries into the two categories is given in the appendix B.

[25] In the French-origin countries, strong accounting standards appear to benefit new equity holders a bit more than they do existing holders.

[26] LLSV (1998) use four creditor rights variables in their analysis. These are based on (1) automatic stay on assets in the reorganization, (2) whether secured creditors are ranked first in the distribution of the proceeds that result from the disposition of the assets of a bankrupt firm, (3) restrictions for going into reorganization, and (4) whether management stays in reorganizations or not. Our breakdown of the countries into the two categories is given in Appendix B.

[27] The $\hat{q}_m$ for the three Asian countries with German-legal-system origins is insignificantly different from 1.0, however. As noted above, the $\hat{q}_m$ for family-controlled companies in these countries is not significantly greater than for other firms.

[28] The countries are (national information provider in parentheses): Austria (Verband der Vereine Creditreform e.V.), Belgium (National Bank of Belgium S.A.) Bulgaria (Creditreform Bulgaria OOD), Czech Republic (Albertina Data), Denmark (Kobmanstandens Oplysningsbureau A/S), Eire (CFI Online Limited), Estonia (Krediidiinfo AS), Finland (Finska - Suomen Asiakastieto Oy), France (SCRL S. A.), Germany (Verband der Vereine Creditreform e.V.), Greece (ICAPHellas S. A.), Hungary (Intercredit Budapest Kft.), Iceland (Icecredit S.p.A.), Latvia (KrediidiinfoAS), Luxembourg (Bureau van Dijk S.A.), The Netherlands (Delwel Uittgeverij B.V. and NV Databank), Norway (Creditinform AS), Poland (Info Credit), Portugal (MOPE Lda), Romania (Romanian Chamber of Industry and Commerce), Slovak Republic (Albertina Data), Spain (Informa S.A.), Sweden (UC AB), Switzerland (D&B Novinform AG), United Kingdom (Jordans).

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